



Supplemental Specifications and Recurring Special Provisions

Adopted January 1, 2003



Illinois Department of Transportation
Division of Aeronautics

INTRODUCTION

This book contains a copy of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS.

The SUPPLEMENTAL SPECIFICATIONS included herein supplement the “Standard Specifications for Construction of Airports”, adopted January, 1985. The SUPPLEMENTAL SPECIFICATIONS are applicable to and included, by reference, in all contracts advertised and awarded by the Division of Aeronautics.

The frequently used RECURRING SPECIAL PROVISIONS included herein may be included, by reference, in selected contracts advertised and awarded by the Division of Aeronautics.

Bidding proposals issued by the Department may contain a “Check Sheet for Recurring Special Provisions” which specifies the RECURRING SPECIAL PROVISIONS applicable to and included in contracts by reference.

The units of measure used shall correspond to the units used in the contract.

SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2003

This sheet contains a listing of SUPPLEMENTAL SPECIFICATIONS and frequently used RECURRING SPECIAL PROVISIONS.

SUPPLEMENTAL SPECIFICATIONS

<u>Std. Spec. Sec.</u>		<u>Page No.</u>
<u>DIVISION I</u> <u>GENERAL PROVISIONS</u>		
10	Definition of Terms	1
20	Scope of Work	2
30	Control of Work	4
40	Control of Materials	13
50	Legal Relations and Responsibility to Public	14
60	Prosecution and Progress	17
70	Measurement and Payment	19

<u>Std. Spec.</u> <u>Item No.</u>		<u>Page No.</u>
--------------------------------------	--	-----------------

DIVISION II
PAVING CONSTRUCTION DETAILS

EARTHWORK

151	Clearing & Grubbing	21
152	Excavation & Embankment	25
155	Lime Treated Subgrade	32

FLEXIBLE BASE COURSES

208	Aggregate Base Course	40
209	Crushed Aggregate Base Course	45
217	Aggregate-Turf Pavement (Not Included)	49

RIGID BASE COURSE

304	Cement Treated Base Course (Not Included)	50
-----	---	----

FLEXIBLE SURFACE COURSES

402	Porous Friction Course	51
-----	------------------------	----

<u>Std. Spec.</u> <u>Item No.</u>		<u>Page No.</u>
MISCELLANEOUS		
602	Bituminous Prime Coat	58
603	Bituminous Tack Coat	62
605	Joint Sealing Filler	68
609	Seal Coats & Bituminous Surface Treatments(Not included)	71
610	Structural Portland Cement Concrete	72
620	Pavement Marking	77
625	Tar Emulsion Protective Seal Coat	88
 <u>DIVISION III</u> <u>FENCING</u>		
161	Wire Fence With Steel Posts	95
162	Chain-Link Fences	99
 <u>DIVISION IV</u> <u>DRAINAGE PIPE</u>		
701	Pipe for Storm Sewers and Culverts	105
705	Pipe Underdrains for Airports	109
751	Manholes, Catch Basins, Inlets, & Inspection Holes	114
752	Concrete Culverts, Headwalls, & Misc. Drainage Structures	117
754	Concrete Gutters, Ditches and Flumes	118
 <u>DIVISION V</u> <u>TURFING</u>		
901	Seeding	120
904	Sodding	123
905	Topsoiling	125
908	Mulching	127
 <u>DIVISION VI</u> <u>LIGHTING INSTALLATION</u>		
101	Installation of Airport Rotating Beacons	130
103	Installation of Airport Beacon Towers	132
107	Installation of Airport 8-Foot & 12-Foot Wind Cones	133
108	Installation of Underground Cable for Airports	134
109	Installation of Airport Transformer Vault & Vault Equip.	145
110	Installation of Airport Underground Electrical Duct	148
125	Installation of Airport Lighting Systems	150

RECURRING SPECIAL PROVISIONS

The following RECURRING SPECIAL PROVISIONS indicated by an "X" are Applicable to this contract and are included by reference:

<u>Check Sheet</u>	<u>NO.</u>	<u>Item No.</u>	<u>Page No.</u>
	1	AR101580 Refurbish 36" Beacon	155
	2	AR106000 Apron Lighting	160
	3	AR119000 Airport Obstruction Lighting (Not Included)	166
	4	AR127000 Airport Navaid Installation (Not Included)	167
	5	AR150510 Engineer's Field Office	168
	6	AR150560 Temporary Threshold	170
	7	AR152540 Soil Stabilization Fabric	173
	8	AR156000 Erosion Control	175
	9	AR156513 Separation Fabric	180
	10	AR156540 Riprap	182
	11	AR201001 Bituminous Base Course - Method I	185
	12	AR201002 Bituminous Base Course - Method II	193
	13	AR201661 Clean & Seal Bituminous Cracks	208
	14	AR201663 Sand Mix Crack Repair	211
	15	AR201671 Crack Control Fabric	213
	16	AR302000 Asphalt Treated Permeable Subbase	215
	17	AR401001 Bituminous Surface Course - Method I	223
	18	AR401002 Bituminous Surface Course - Method II	231
	19	AR401640 Bituminous Pavement Grooving	247
	20	AR401650 Bituminous Pavement Milling	250
	21	AR401655 Butt Joint Construction	252
	22	AR401900 Remove Bituminous Pavement	254
	23	AR501001 Portland Cement Concrete - Pavement Method I	256
	24	AR501002 Portland Cement Concrete - Pavement Method II	272
	25	AR501003 Portland Cement Concrete - Pavement Method III	293
	26	AR501115 Crack and Seat Pavement	315
	27	AR501540 PCC Pavement Grooving	318
	28	AR501550 PCC Pavement Milling	321
	29	AR501900 Remove PCC Pavement	323
	30	AR510500 Tie-down/Ground Rod	325
	31	AR605000 Silicone Joint Sealing Filler	326

The following pay items are included in the Supplemental Specifications:

- Item AR103551 -- Structural Steel Tower 51' -- per each
- Item AR103651 -- Tubular Steel Tower -- 51' -- per each
- Item AR103900 -- Remove Beacon Tower -- per each
- Item AR103960 -- Relocate Beacon Tower -- per each
- Item AR108108 -- 1/C #8 5KV UG Cable -- per linear foot
- Item AR108158 -- 1/C #8 5KV UG Cable in UD -- per linear foot
- Item AR108208 -- 2/C #8 5KV UG Cable -- per linear foot
- Item AR108258 -- 2/C #8 5KV UG Cable in UD -- per linear foot
- Item AR108408 -- 1/C #8 600 V UG Cable -- per linear foot
- Item AR108458 -- 1/C #8 600 V UG Cable in UD -- per linear foot
- Item AR108508 -- 2/C #8 600 V UG Cable -- per linear foot
- Item AR108558 -- 2/C #8 600 V UG Cable in UD -- per linear foot
- Item AR108758 -- 1/C #8 Ground -- per linear foot
- Item AR108800 -- Control Cable -- per linear foot
- Item AR108819 -- 19 Pair Control Cable -- per linear foot
- Item AR108966 -- Relocate Cable -- per linear foot
- Item AR109100 -- Construct Electrical Vault -- per lump sum
- Item AR109110 -- Erect Prefabricated Vault -- per lump sum
- Item AR109120 -- Erect Electrical Transclosure -- per lump sum
- Item AR109210 -- Vault Modifications -- per lump sum
- Item AR110011 -- 1" Directional Bore -- per linear foot
- Item AR110012 -- 2" Directional Bore -- per linear foot
- Item AR110013 -- 3" Directional Bore -- per linear foot
- Item AR110014 -- 4" Directional Bore -- per linear foot
- Item AR110211 -- 1" Steel Duct, Direct Bury -- per linear foot
- Item AR110212 -- 2" Steel Duct, Direct Bury -- per linear foot
- Item AR110213 -- 3" Steel Duct, Direct Bury -- per linear foot
- Item AR110214 -- 4" Steel Duct, Direct Bury -- per linear foot
- Item AR110501 -- 1-Way Conc. Encased Duct -- per linear foot
- Item AR110502 -- 2-Way Concrete Encased Duct -- per linear foot
- Item AR110504 -- 4-Way Concrete Encased Duct -- per linear foot
- Item AR110506 -- 6-Way Concrete Encased Duct -- per linear foot
- Item AR110508 -- 8-Way Concrete Encased Duct -- per linear foot
- Item AR110512 -- 12-Way Concrete Encased Duct -- per linear foot
- Item AR110516 -- 16-Way Conc. Encased Duct -- per linear foot
- Item AR110552 -- Extend 2-way Duct -- per linear foot
- Item AR110554 -- Extend 4-way Duct -- per linear foot
- Item AR125100 -- Elevated Retroreflective Marker -- per each
- Item AR125410 -- MITL -- Stake Mounted -- per each
- Item AR125415 -- MITL -- Base Mounted -- per each
- Item AR125420 -- Taxiway Light Inpavement -- per each
- Item AR125441 -- Taxi Guidance Sign, 1 Character -- per each
- Item AR125442 -- Taxi Guidance Sign, 2 Character -- per each
- Item AR125443 -- Taxi Guidance Sign, 3 Character -- per each
- Item AR125444 -- Taxi Guidance Sign, 4 Character -- per each
- Item AR125445 -- Taxi Guidance Sign, 5 Character -- per each.
- Item AR125446 -- Taxi Guidance Sign, 6 Character -- per each
- Item AR125447 -- Taxi Guidance Sign, 7 Character -- per each
- Item AR125448 -- Taxi Guidance Sign, 8 Character -- per each
- Item AR125449 -- Taxi Guidance Sign, 9 Character -- per each
- Item AR125461 -- Taxi Guidance Sign, Special -- per each
- Item AR125470 -- Modify Existing Sign Panel -- per each
- Item AR125505 -- MIRL, Stake Mounted -- per each
- Item AR125510 -- MIRL -- Base Mounted -- per each

Item AR125515 -- HIRL, Base Mounted -- per each
Item AR125525 -- HIRL, Inpavement -- per each
Item AR125540 -- MI Threshold Light Stake Mtd -- per each
Item AR125545 -- MI Threshold Light Base Mtd -- per each
Item AR125550 -- HI Threshold Light Base Mtd -- per each
Item AR125555 -- Threshold Lights, Inpavement -- per each
Item AR125560 -- Runway Distance Remaining Sign -- per each
Item AR125565 -- Splice Can -- per each
Item AR125610 -- REILS -- per pair
Item AR125615 -- PAPI (L-880 System) -- per each
Item AR125620 -- Abbreviated PAPI (L-881 System) -- per each
Item AR125901 -- Remove Stake Mounted Light -- per each
Item AR125902 -- Remove Base Mounted Light -- per each
Item AR125903 -- Remove Inpavement Light -- per each
Item AR125904 -- Remove Taxi Guidance -- per each
Item AR125905 -- Remove Rwy Distance Remain Sign -- per each
Item AR125906 -- Remove Splice Can -- per each
Item AR125907 -- Remove REILS -- per pair
Item AR125908 -- Remove PAPI -- per each
Item AR125909 -- Remove VASI -- per each
Item AR125910 -- Remove PLASI -- per each
Item AR125941 -- Adjust Stake Mounted Light -- per each
Item AR125942 -- Adjust Base Mounted Light -- per each
Item AR125943 -- Adjust Inpavement Light -- per each
Item AR125944 -- Adjust Taxi Guidance -- per each
Item AR125945 -- Adjust Rwy Distance Remain Sign -- per each
Item AR125946 -- Adjust Splice Can -- per each
Item AR125947 -- Adjust REILS -- per pair
Item AR125948 -- Adjust PAPI -- per each
Item AR125949 -- Adjust VASI -- per each
Item AR125950 -- Adjust PLASI -- per each
Item AR125961 -- Relocate Stake Mounted Light -- per each
Item AR125962 -- Relocate Base Mounted Light -- per each
Item AR125963 -- Relocate Inpavement Light -- per each
Item AR125964 -- Relocate Taxi Guidance -- per each
Item AR125965 -- Relocate Rwy Distance Remain Sign -- per each
Item AR125966 -- Relocate Splice Can -- per each
Item AR125967 -- Relocate REILS -- per pair
Item AR125968 -- Relocate PAPI -- per each
Item AR125969 -- Relocate VASI -- per each
Item AR125970 -- Relocate PLASI -- per each
Item AR151410 -- Clearing -- per acre
Item AR151420 -- Clearing Trees 0-2.5' Butt Dia. -- per each
Item AR151430 -- Clearing Trees 2.5'-5' Butt Dia. -- per each
Item AR151440 -- Clearing Trees Over 5' Butt Dia. -- per each
Item AR151450 -- Clearing and Grubbing -- per acre
Item AR152410 -- Unclassified Excavation -- per cubic yard
Item AR152440 -- Borrow Excavation -- per cubic yard
Item AR152442 -- Offsite Borrow Excavation -- per cubic yard
Item AR152480 -- Shoulder Adjustment -- per square yard
Item AR155540 -- By-Product Lime -- per ton
Item AR155606 -- Soil Processing - 6" -- per square yard
Item AR155608 -- Soil Processing - 8" -- per square yard
Item AR155612 -- Soil Processing - 12" -- per square yard
Item AR155616 -- Soil Processing - 16" -- per square yard
Item AR161510 -- Class C Fence -- per linear foot

Item AR161604 -- Class C Gate - 4' -- per each
 Item AR161612 -- Class C Gate - 12' -- per each
 Item AR161616 -- Class C Gate - 16' -- per each
 Item AR161618 -- Class C Gate - 18' -- per each
 Item AR161620 -- Class C Gate - 20' -- per each
 Item AR161624 -- Class C Gate - 24' -- per each
 Item AR161630 -- Class C Gate - 30' -- per each
 Item AR161900 -- Remove Class C Fence -- per linear foot
 Item AR161910 -- Remove Class C Gate -- per each
 Item AR161960 -- Relocate Class C Fence -- per linear foot
 Item AR161961 -- Relocate Existing Gate -- per each.
 Item AR162504 -- Class E Fence 4'-- per linear foot
 Item AR162506 -- Class E Fence 6' -- per linear foot
 Item AR162508 -- Class E Fence 8' -- per linear foot
 Item AR162510 -- Class E Fence 10' -- per linear foot
 Item AR162604 -- Class E Gate - 4' -- per each
 Item AR162605 -- Class E Gate - 5' -- per each
 Item AR162606 -- Class E Gate - 6' -- per each
 Item AR162610 -- Class E Gate - 10' -- per each
 Item AR162612 -- Class E Gate - 12' -- per each
 Item AR162614 -- Class E Gate - 14' -- per each
 Item AR162616 -- Class E Gate - 16' -- per each
 Item AR162618 -- Class E Gate - 18' -- per each
 Item AR162620 -- Class E Gate - 20' -- per each
 Item AR162624 -- Class E Gate - 24' -- per each
 Item AR162628 -- Class E Gate - 28' -- per each
 Item AR162630 -- Class E Gate - 30' -- per each
 Item AR162712 -- Electric Gate -- 12' -- per each
 Item AR162714 -- Electric Gate -- 14' -- per each
 Item AR162715 -- Electric Gate -- 15' -- per each
 Item AR162716 -- Electric Gate -- 16' -- per each
 Item AR162718 -- Electric Gate -- 18' -- per each
 Item AR162720 -- Electric Gate -- 20' -- per each
 Item AR162722 -- Electric Gate -- 22' -- per each
 Item AR162724 -- Electric Gate -- 24' -- per each
 Item AR162725 -- Electric Gate -- 25' -- per each
 Item AR162728 -- Electric Gate -- 28' -- per each
 Item AR162730 -- Electric Gate -- 30' -- per each
 Item AR162900 -- Remove Class E Fence -- per linear foot
 Item AR162908 -- Remove Electric Gate -- per each
 Item AR162910 -- Remove Class E Gate -- per each
 Item AR162920 -- Remove Manual Slide Gate -- per each
 Item AR162960 -- Relocate Class E Fence -- per linear foot
 Item AR162961 -- Relocate Gate -- 4' -- per each
 Item AR162962 -- Relocate Gate -- 24' -- per each
 Item AR162963 -- Relocate Gate -- 5' -- per each
 Item AR208510 -- Aggregate Base Course -- per ton
 Item AR208604 -- 4" Aggregate Base Course -- per square yard
 Item AR208605 -- 5" Aggregate Base Course -- per square yard
 Item AR208606 -- 6" Aggregate Base Course -- per square yard
 Item AR208608 -- 8" Aggregate Base Course -- per square yard
 Item AR208610 -- 10" Aggregate Base Course -- per square yard
 Item AR209510 -- Crushed Aggregate Base Course -- per ton
 Item AR209604 -- Crushed Agg. Base Course -- 4" -- per square yard.
 Item AR209606 -- Crushed Agg. Base Course -- 6" -- per square yard.
 Item AR209607 -- Crushed Agg. Base Course -- 7" -- per square yard.

Item AR209608 -- Crushed Agg. Base Course -- 8" -- per square yard.
 Item AR209609 -- Crushed Agg. Base Course -- 9" -- per square yard.
 Item AR209610 -- Crushed Agg. Base Course -- 10" -- per square yard.
 Item AR209611 -- Crushed Agg. Base Course -- 11" -- per square yard.
 Item AR209612 -- Crushed Agg. Base Course -- 12" -- per square yard.
 Item AR209613 -- Crushed Agg. Base Course -- 13" -- per square yard.
 Item AR209617 -- Crushed Agg. Base Course -- 17" -- per square yard.
 Item AR209618 -- Crushed Agg. Base Course -- 18" -- per square yard.
 Item AR209624 -- Crushed Agg. Base Course -- 24" -- per square yard.
 Item AR402620 -- Porous Friction Course 5/8" -- per square yard
 Item AR402621 -- Porous Friction Course, 1" -- per square yard
 Item AR402622 -- Porous Friction Course, 0.10' -- per square yard
 Item AR602510 -- Bituminous Prime Coat -- per gallon
 Item AR603510 -- Bituminous Tack Coat -- per gallon
 Item AR620520 -- Pavement Marking -- Waterborne -- per square foot
 Item AR620525 -- Pavement Marking -- Black Border -- per square foot
 Item AR620530 -- Pavement Marking -- Epoxy -- per square foot
 Item AR620590 -- Temporary Marking -- per square foot
 Item AR620900 -- Pavement Marking Removal -- per square foot
 Item AR625510 -- Tar Emulsion Seal Coat -- per square yard
 Item AR701412 -- 12" RCP, Class III -- per linear foot
 Item AR701415 -- 15" RCP, Class III -- per linear foot
 Item AR701418 -- 18" RCP, Class III -- per linear foot
 Item AR701424 -- 24" RCP, Class III -- per linear foot
 Item AR701430 -- 30" RCP, Class III -- per linear foot
 Item AR701436 -- 36" RCP, Class III -- per linear foot
 Item AR701442 -- 42" RCP, Class III -- per linear foot
 Item AR701448 -- 48" RCP, Class III -- per linear foot
 Item AR701512 -- 12" RCP, Class IV -- per linear foot
 Item AR701515 -- 15" RCP, Class IV -- per linear foot
 Item AR701518 -- 18" RCP, Class IV -- per linear foot
 Item AR701524 -- 24" RCP, Class IV -- per linear foot
 Item AR701530 -- 30" RCP, Class IV -- per linear foot
 Item AR701536 -- 36" RCP, Class IV -- per linear foot
 Item AR701542 -- 42" RCP, Class IV -- per linear foot
 Item AR701548 -- 48" RCP, Class IV -- per linear foot
 Item AR701900 -- Remove Pipe -- per linear foot
 Item AR705524 -- 4" Perforated Underdrain w/Sock -- per linear foot
 Item AR705526 -- 6" Perforated Underdrain w/Sock -- per linear foot
 Item AR705528 -- 8" Perforated Underdrain w/Sock -- per linear foot
 Item AR705530 -- 10" Perforated Underdrain w/Sock -- per linear foot
 Item AR705544 -- 4" Non Perforated Underdrain -- per linear foot
 Item AR705546 -- 6" Non Perforated Underdrain -- per linear foot
 Item AR705548 -- 8" Non Perforated Underdrain -- per linear foot
 Item AR705550 -- 10" Non Perforated Underdrain -- per linear foot
 Item AR705610 -- Concrete Headwall for Underdrain -- per linear foot
 Item AR705620 -- Underdrain End Section -- per each
 Item AR705630 -- Underdrain Inspection Hole -- per each
 Item AR705635 -- Underdrain Collection Structure -- per each
 Item AR705640 -- Underdrain Cleanout -- per each
 Item AR751410 -- Inlet -- per each
 Item AR751411 -- Inlet -- Type A -- per each
 Item AR751412 -- Inlet -- Type B -- per each
 Item AR751415 -- Inlet -- Special -- per each
 Item AR751530 -- Manhole -- per each
 Item AR751540 -- Manhole 4' -- per each

Item AR751550 -- Manhole 5' -- per each
Item AR751560 -- Manhole 6' -- per each
Item AR751567 -- Manhole 7' -- per each
Item AR751568 -- Manhole 8' -- per each
Item AR751570 -- Manhole - Special -- per each
Item AR751940 -- Adjust Inlet -- per each
Item AR751943 -- Adjust Manhole -- per each
Item AR751949 -- Adjust Inspection Hole -- per each
Item AR751952 -- Adjust Special Structure -- per each
Item AR752412 -- Precast Reinforced Conc. Fes 12" -- per each
Item AR752415 -- Precast Reinforced Conc. Fes 15" -- per each
Item AR752418 -- Precast Reinforced Conc. Fes 18" -- per each
Item AR752424 -- Precast Reinforced Conc. Fes 24" -- per each
Item AR752430 -- Precast Reinforced Conc. Fes 30" -- per each
Item AR752436 -- Precast Reinforced Conc. Fes 36" -- per each
Item AR752442 -- Precast Reinforced Conc. Fes 42" -- per each
Item AR752448 -- Precast Reinforced Conc. Fes 48" -- per each
Item AR752512 -- Grating for Conc. Fes 12" -- per each
Item AR752515 -- Grating for Conc. Fes 15" -- per each
Item AR752518 -- Grating for Conc. Fes 18" -- per each
Item AR752524 -- Grating for Conc. Fes 24" -- per each
Item AR752530 -- Grating for Conc. Fes 30" -- per each
Item AR752536 -- Grating for Conc. Fes 36" -- per each
Item AR752542 -- Grating for Conc. Fes 42" -- per each
Item AR752548 -- Grating for Conc. Fes 48" -- per each
Item AR752850 -- Special Structure -- per each
Item AR754210 -- Concrete Curb -- per linear foot
Item AR754212 -- Concrete Curb Type B -- per linear foot
Item AR754214 -- Concrete Curb Type M -- per linear foot
Item AR754310 -- Concrete Gutter -- per linear foot
Item AR754312 -- Concrete Gutter, Type A -- per linear foot
Item AR754314 -- Concrete Gutter, Type B -- per linear foot
Item AR754410 -- Comb Concrete Curb & Gutter -- per linear foot
Item AR754412 -- Concrete Curb & Gutter (Type B6.24) -- per linear foot
Item AR754900 -- Remove Concrete Curb -- per linear foot
Item AR754902 -- Remove Concrete Curb & Gutter -- per linear foot
Item AR754904 -- Remove Comb Curb & Gutter -- per linear foot
Item AR901510 -- Seeding -- per acre
Item AR904510 -- Sodding -- per square yard
Item AR908510 -- Mulching -- per acre

The following pay items are included in the Recurring Special Provisions:

Item AR101580 -- Refurbish 36" Beacon -- per lump sum
Item AR106502 -- Apron Light Pole W/ DoubleTriple Fixture -- per each
Item AR106503 -- Apron Light Pole W/ Triple Fixture -- per each
Item AR106504 -- Apron Light Pole W/ Quad Fixture -- per each
Item AR150510 -- Engineer's Field Office -- per lump sum
Item AR150560 -- Temporary Threshold -- per lump sum
Item AR152540 -- Soil Stabilization Fabric -- per square yard
Item AR156510 -- Silt Fence -- per linear foot
Item AR156512 -- Bales -- per each
Item AR156513 -- Separation Fabric -- per square yard
Item AR156540 -- Riprap -- per square yard
Item AR201610 -- Bituminous Base Course -- per ton.
Item AR201620 -- Bituminous Base Course, Leveling -- per ton
Item AR201630 -- Bituminous Base Test Section -- per each
Item AR201661 -- Clean & Seal Bituminous Cracks -- per linear foot
Item AR201663 -- Sand Mix Crack Repair -- per linear foot
Item AR201670 -- Crack Control Fabric -- per square yard
Item AR302611 -- Asphalt Treated Permeable Subbase -- per square yard
Item AR302630 -- ATPS Test Section -- per each
Item AR401610 -- Bituminous Surface Course -- per ton
Item AR401620 -- Bit. Surface Course, Leveling -- per ton
Item AR401630 -- Bituminous Surface Test Section -- per each
Item AR401640 -- Bituminous Pavement Grooving -- per square yard
Item AR401550 -- Bituminous Pavement Milling -- per square yard
Item AR401655 -- Butt Joint Construction -- per square yard
Item AR401900 -- Remove Bituminous Pavement -- per square yard
Item AR501505 -- 5" PCC Pavement -- per square yard
Item AR501506 -- 6" PCC Pavement -- per square yard
Item AR501507 -- 7" PCC Pavement -- per square yard
Item AR501508 -- 8" PCC Pavement -- per square yard
Item AR501509 -- 9" PCC Pavement -- per square yard
Item AR502510 -- 10" PCC Pavement -- per square yard
Item AR502511 -- 11" PCC Pavement -- per square yard
Item AR501512 -- 12" PCC Pavement -- per square yard
Item AR501513 -- 13" PCC Pavement -- per square yard
Item AR501514 -- 14" PCC Pavement -- per square yard
Item AR501515 -- 15" PCC Pavement -- per square yard
Item AR501516 -- 16" PCC Pavement -- per square yard
Item AR501517 -- 17" PCC Pavement -- per square yard
Item AR501518 -- 18" PCC Pavement -- per square yard
Item AR501519 -- 19" PCC Pavement -- per square yard
Item AR501520 -- 20" PCC Pavement -- per square yard
Item AR501530 -- PCC Test Batch -- per each
Item AR501115 -- Crack & Seal Pavement -- per square yard
Item AR501540 -- PCC Pavement Grooving -- per square yard
Item AR501550 -- PCC Pavement Milling -- per square yard
Item AR501900 -- Remove PCC Pavement -- per square yard
Item AR510510 -- Tie Down -- per each
Item AR510515 -- Ground Rod -- per each
Item AR510900 -- Remove Tiedown -- per each

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
SECTION 10. DEFINITION OF TERMS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 10. "Definition Of Terms" is modified as outlined below:

10-05 ADVERTISEMENT

ADD: Advertisement for bids will be issued by, and in conformance with, the policies of the Illinois Department of Transportation.

10-43 PAY ITEMS

ADD: All pay items included in the Supplemental Specifications and Recurring Special Provisions are shown with an AR designation (Example Item AR151410 -- Clearing) which indicates a base bid pay item and quantity. Additive Alternate pay items shall be designated by AS, AT, and AU corresponding to Additive Alternate 1, 2, and 3, respectively. Example: AS151410 – Clearing is the pay item for Additive Alternate 1 clearing quantities.

ADD:

10-81 AIRPORT IMPROVEMENT PROGRAM (AIP)

A grant-in-aid program, administered by the Federal Aviation Administration.

ADD:

10-82 AIRPORT MANAGEMENT

The person and his/her representatives responsible for the daily management and operation of the airport.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
SECTION 20. SCOPE OF WORK

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 20. "Scope Of Work" is modified as outlined below:

20-02 ALTERATION OF WORK AND QUANTITIES

Add after the first paragraph:

Should the total cost of any major contract item change by 25 percent or more, with the aggregate amount of altered work less than the 25 percent limitation hereinbefore specified, the alteration shall be subject to approval, prior to construction, by the Engineer and handled as a supplemental agreement.

Revise the first sentence of the third paragraph to read:

For AIP projects, all supplemental agreements shall be approved by the FAA and shall include valid wage determinations of the U.S. Secretary of Labor when the amount of the supplemental agreement exceeds \$2,000.00.

20-05 MAINTENANCE OF TRAFFIC

ADD: Air traffic shall be maintained at the airport throughout the construction period as shown in the Safety and Phasing Plan. All construction along a runway, taxiway, or apron edge necessitating its closure shall be expedited to minimize closure time.

The Airport Management will give proper notice to the nearest Flight Service Station and the Airways Facilities Chief of the Federal Aviation Administration prior to beginning construction.

If it will be necessary to close portions of the Runways, Apron and Taxiways during the proposed construction, the Contractor shall notify the Airport Management through the Resident Engineer a minimum of 72 hours prior to the initiation of any work which requires closure of active airfield pavements for the issuance of the appropriate Notice to Airmen (NOTAM) and user coordination.

The Contractor shall consult with the Resident Engineer in arranging his construction operations. The Airport Management will at all times have jurisdiction over the safety of air and ground traffic during construction. Wherever the safety of air traffic during construction is concerned, his decisions as to methods, procedures and measures used shall be final, and any and all Contractors performing work must be governed by such decisions.

The Contractor shall not be entitled to any extra compensation due to delays or inconveniences caused by said necessary methods, procedures, and measures to protect air and ground traffic.

The Contractor shall be responsible for cleaning and maintaining all haul roads to the work area. The Contractor shall maintain these areas as required or as directed by the Resident Engineer. Should the Contractor fail to respond to the Resident Engineer's notification, the Division may suspend work until such time as the unsatisfactory condition is corrected.

A flagger in contact with the Common Traffic Advisory Frequency (CTAF) shall be furnished by the Contractor at any time the active runways, taxiways, or airfield pavement are crossed or used for a haul road. The flagger shall be located to direct vehicular traffic to and from the construction operation. Flaggers shall be experienced in radio operation at an airport. The Contractor shall provide his own radio capable of transmitting and receiving on the CTAF.

The Contractor shall notify the FAA Airways Facilities Field Office or System Management Office a minimum of 72 hours prior to working in NAVAID critical areas.

20-07 RIGHTS IN THE USE OF MATERIALS FOUND IN WORK

ADD: No material found or abandoned during the work shall be taken from the airport without the approval of the Resident Engineer. The Airport Management reserves the right to any material found or abandoned during the work. Any such material shall be turned over to the Airport Management at a site designated by the Resident Engineer.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
SECTION 30. CONTROL OF WORK

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 30. "Control Of Work" is modified as outlined below:

30-03 COORDINATION OF CONTRACT, PLANS, AND SPECIFICATIONS.

DELETE: The last sentence of the first paragraph.

ADD: In case of discrepancy, calculated dimensions govern over scaled dimensions and the following relationships apply:

Special Provisions	Hold over:	Plans Recurring Special Provisions Supplemental Specifications Specifications
Plans	Hold over:	Recurring Special Provisions Supplemental Specifications Specifications
Recurring Special Provisions	Hold over:	Supplemental Specifications Specifications
Supplemental Specifications	Hold over:	Specifications
Contract Plans	Hold over:	Standard Plans

STANDARD SPECIFICATIONS

Technical Specifications	Hold over:	General Provisions Cited Standards for Materials Or Testing Cited Standards for Materials Or Testing Cited FAA Advisory Circulars
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General Provisions	Hold over: Cited Standards for Materials Or Testing Cited Standards for Materials Or Testing Cited FAA Advisory Circulars
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30-04 COOPERATION OF CONTRACTOR

ADD: A weekly meeting shall be scheduled during construction to discuss work areas, scheduling, etc. The superintendent for the project, the subcontractor's foreman, and the Resident Engineer are required to attend this meeting. The Airport Management and the Division may attend the meeting.

30-05 COOPERATION BETWEEN CONTRACTORS

ADD: Other contracts may be under construction concurrently resulting in more than one contractor working on the airport at the same time.

The Contractor shall plan and conduct his work so as not to interfere or hinder the progress or work being performed by other contractors. The timely prosecution of the overall project is dependent upon the proper coordination between contractors. It is to be fully understood by the Contractor that the prosecution of the overall projects and the safety and convenience of the aviation public are the governing criteria for resolving conflicts which may arise between his schedule and the schedule of other contractors. When conflicts arise, resolution of such conflicts will be made by the Airport Management through the Resident Engineer in the best interest of the airport. Delays, changes in scheduling, or expedition of work under this contract to coordinate the timely prosecution of work will be considered incidental to the contract and no additional compensation will be allowed.

30-06 CONSTRUCTION LAYOUT

DELETE: Entire Section.

ADD: CONSTRUCTION LAYOUT STAKES

The Contractor will be required to furnish and place construction layout stakes for this project. The Resident Engineer will locate and reference the centerline of survey and all intersecting points and will establish bench marks along the line of the improvement outside construction limits. Locating and referencing the centerline of survey shall consist of locating and referencing control points such as point of curvature, points of tangent, and sufficient points on tangent to provide a line of sight. Control points set by the Resident Engineer shall be identified in the field to the Contractor, and the field notes shall be kept in the office of the Resident Engineer.

The Contractor shall provide field surveys directed by a registered surveyor or engineer, and set all additional stakes for this project which are needed to establish offset stakes, reference points, slope stakes, pavement and grade, stakes for culverts, sewers and drainage structures, paved gutters, walls, monuments, fence, right-of-way lines, and any other horizontal or vertical controls, including supplementary bench marks necessary to secure a correct layout of the work. Grading slope stakes shall be set at sufficient intervals (not to exceed 100 feet) to accurately outline the slopes. Stakes for line and grade of pavement shall be set at sufficient station intervals (not to exceed 25 feet) to assure substantial conformance to plan line and grade. Staking of right-of-way lines, if applicable, shall consist of placing tall stakes, properly identified and readily discernible, at points of change in width or direction of the right-of-way and at points along the line so that at least two of the stakes can be seen distinctly from any point of the line. Right-of-way lines shall be staked at locations where construction is to be performed prior to beginning construction. The Contractor will not be required to set additional stakes to locate a utility line which is not included as a pay item in the contract, or to determine the property line between properties.

The Contractor shall be responsible for having the finished work substantially conform to the line, grades, elevations and dimensions called for in the plans. Any inspection or checking of the Contractor's layout by the Resident Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his responsibility to secure the proper dimensions, grades, and elevations of the several parts of the work. The Contractor shall exercise care in the preservation of stakes and bench marks, and shall have them reset by a registered land surveyor at his expense when any are damaged, lost, displaced or removed. The Contractor shall use a registered surveyor or engineer and competent personnel and suitable equipment for the layout work required.

RESPONSIBILITY OF THE RESIDENT ENGINEER

- A. The Resident Engineer will locate and reference the centerline of all pavements and applicable baselines at 500 ft intervals. Locating and referencing the centerline of survey will consist of locating and referencing the control points of the centerline such as PC's, PT's, and as many POT's as are necessary to provide a line of sight.
- B. Bench marks will be established along the project outside of construction lines and not exceeding 1,000 foot intervals horizontally and 20 feet vertically.
- C. Stakes set for A. and B. above shall be identified in the field to the Contractor and the field notes kept in the Resident Engineer's office for references by him.
- D. The Resident Engineer will check clearances both horizontal and vertical at all grade separations, if applicable.

- E. The Resident Engineer will make random checks of the Contractor's staking to determine if the work is in substantial conformance with the plans. Where the Contractor's work will tie into the work that is being or will be done by others, checks will be made to determine if the work is in conformance with the proposed overall grade and horizontal alignment.
- F. The Resident Engineer will set all stakes for utility adjustments and for building fences, if necessary, along the right-of-way line by parties other than the Contractor.
- G. Immediately after the Contractor has staked the drainage structures, the Resident Engineer will check the staking, either visually or by instrument, to determine if the structures fit the waterways in horizontal alignment and vertical elevation. If it is necessary to redesign the drainage structure, the Resident Engineer will furnish a revised design and **re-stake** the structure.
- H. The Resident Engineer will make all measurements and take all cross sections from which the various pay items are to be measured, such as cross sections for all borrow pits and channel changes, additional measurements needed to determine the amount of earthwork and all measurements on which the depth of subbase, bases or pavements are to be verified.
- I. Where the Contractor, in setting construction stakes, discovers discrepancies, the Resident Engineer will check to determine their nature and make whatever revisions are necessary in the plans, including the recross-sectioning of the area involved, and all additional **re-staking** necessary.
- J. The Resident Engineer will accept responsibility for the accuracy of specific stakes that are covered by random instrument checks and recorded, provided no displacement occurs. Any errors that are apparent shall be immediately called to the Contractor's attention, and the Contractor shall be required to make the necessary correction before the stakes are used for construction purposes.
- K. All measurements necessary to determine the final pay quantities must be made by the Resident Engineer independently of the Contractor's station stakes and any bench marks established by the Contractor.
- L. If requested, the Resident Engineer will furnish a schedule showing the pavement profile grade elevations at intervals of 25 feet.

RESPONSIBILITY OF THE CONTRACTOR

- A. The Contractor will set all other stakes necessary to establish limits and elevations of the work and shall define right-of-way for the project, if applicable.
- B. The right-of-way shall be considered to be defined when stakes readily discernible, have been placed at points of change in width or direction of

the right-of-way line and at points along the line so that at least two such right-of-way stakes can be seen from any point on the line.

- C. The Contractor will not be required to set additional stakes to locate a utility line or to determine the property line between properties.
- D. Field notes shall be kept in standard survey field notebooks and these books shall become the property of the Division at the completion of the project.
- E. It is not considered the responsibility of the Contractor to make a detailed check of the accuracy of the plans; however, it is expected that the Contractor will advise the Resident Engineer promptly of known errors in the plans.
- F. The Contractor shall reset the existing control points shown on the plans and establish ties for the reset points.

The ties established shall meet the approval of the Resident Engineer.

The Contractor will be restricted to iron pins or drill holes for monumentation. Nails and iron pins shall not be used in locations where they could be removed by snow plows.

The control points to be reset are all survey monuments, PI's, PC's PT's, and POT's.

This item shall not be paid for separately, but shall be considered incidental to the pay item for which the layout is required.

- G. The Contractor shall be required to establish a grid at the edges of each paving line on 25' centers and document elevations prior to placing the proposed pavement. These grades shall immediately be provided to the Resident Engineer. The Contractor shall also provide a table showing the existing pavement elevations, proposed pavement elevations and the proposed pavement thickness a minimum of 36 hours prior to paving. If for any reason the pavement thickness is less than the design thickness, the profiles may be adjusted.

30-10 **INSPECTION OF WORK**

ADD: Work performed by the Contractor outside of daylight hours shall be done under sufficient artificial area lighting to allow for proper construction methods and inspection.

Lights shall consist of vehicle or moveable pole mounted floodlights and/or spotlights of sufficient number to illuminate the work area. Vehicle headlights will be allowed only in addition to other lights mentioned above. Lighting shall not interfere with air operations. Any work being performed under insufficient artificial lighting, in the Resident Engineer's judgement, shall be stopped until such time as additional lighting is provided. All work performed during that time will not be acceptable until proper inspection and testing can be made.

30-12 **LOAD RESTRICTIONS**

ADD: Prior to the start of construction operations, the Resident Engineer and the Contractor shall document the condition of the local roads and the airport entrance roads to be used for Contractor's access and haul routes.

Contractor's use of the existing airfield pavement and airport entrance pavements by equipment and loaded trucks shall be minimized. Any damage to existing airport pavement shall be repaired by the Contractor at his own expense.

If the Contractor uses existing airfield pavements, he shall sweep all airport pavements as directed by the Resident Engineer or Airport Management. Failure to comply with the Resident Engineer's or Airport Management's directives will be grounds for suspension of work until such time as the unsatisfactory condition is corrected.

30-13 **MAINTENANCE DURING CONSTRUCTION**

ADD: Waste and loose material capable of causing damage to aircraft landing gears, propellers or engines should not be placed on active aircraft movement areas. Material tracked on these areas shall be removed continuously during the work.

30-18 **PLANS AND WORK DRAWINGS**

ADD: The Contractor shall prepare shop, working, or layout drawings for all parts of the work. Before commencing any work or providing any material, the Contractor shall submit for review by the Project Engineer, all drawings relating to the construction arrangement or disposition of the work including drainage and electrical materials entering into the contract, and show the complete materials with manufacturer's specifications of same. The Contractor shall carefully check all his drawings making sure they are complete in all detail.

Shop drawings submitted by the Contractor for materials and/or equipment to be provided as a part of the contract shall be reviewed by the Project

Engineer. Shop drawings shall be fully descriptive, complete and of sufficient detail for ready determination of compliance.

Shop drawings submittals shall contain a letter of certification from the manufacturer stating that all materials furnished for the project conform to the contract documents requirements.

The review of the submittals by the Project Engineer with no exceptions taken will indicate only that the general method of construction and detailing is satisfactory. Such review will not relieve the Contractor of the responsibility for any error which may exist as the Contractor is responsible for the dimensions and designs of adequate connections, detail and satisfactory construction of all work. The Project Engineer shall note any exceptions taken to date submitted and indicate when resubmittal is required to determine compliance.

To aid the Contractor in his preparation of the shop drawing submittal, a list of submittals will be provided by the Division at the pre-construction conference. This list will not be considered by the Contractor as being complete. The Resident Engineer or the Division at his option may request additional information if in his opinion, the information is necessary to adequately review the work.

Drawings shall be submitted within two weeks after the date of the Notice to Proceed or within six weeks of the Notice of Award whichever occurs first.

The Contractor shall submit at least eight (8) copies of each drawing to be reviewed, of which six (6) copies will be retained by the Project Engineer for his use and records. Two (2) copies of each drawing will be returned to the Contractor.

The following information shall be clearly marked on each shop, working, and layout drawing, catalog cut, pamphlet specifications sheet, etc., submitted.

PROJECT LOCATION: (Airport Name)

PROJECT TITLE:

PROJECT NUMBERS: Illinois Project:
AIP Project:

CONTRACT ITEM:

SUBMITTED BY: (Contractor/Subcontractor Name)

DATE:

ADD:

30-19 MATERIAL DOCUMENTATION RESPONSIBILITIES OF THE CONTRACTOR

The Standard Specifications for Construction of Airports make provisions for inspection of materials and construction and establish that it is the Contractor's responsibility to provide materials that meet specification requirements and to produce work strictly in accordance with the intent of the plans and specifications. It requires the close cooperation and communication between the Contractor, the Resident Engineer and the producer/supplier to assure proper inspection coverage. The Contractor's responsibilities include but aren't limited to:

1. As far in advance as possible, the Contractor shall furnish the Resident Engineer information as to the producers (not the suppliers) of all materials and all components that will be used on the project.
2. The Contractor shall order materials as early as possible and notify the District Office or the Bureau of Materials and Physical Research so that proper arrangements may be made for inspection if the material is source inspected and approved under IDOT jurisdiction. When contacting IDOT, the Contractor shall reference the MISTIC Contract Number for the contract.
3. The Contractor shall notify the supplier that State inspection is required and inform the supplier not to ship without inspection.
4. When ordering, the Contractor shall give the supplier the correct MISTIC Contract Number (A####-1), kind of material by specification identification and the type of construction for which it is to be used. He shall instruct the supplier that this information should appear on the delivery ticket. A copy of the delivery ticket and any evidence of inspection shall be forwarded to the Resident Engineer.
5. The Contractor shall submit to the Resident Engineer a catalog cut/specification sheet for the material and a letter of certification from the producer that the material will meet the project specifications. These submittals should be made as far in advance of installation as possible.
6. The Contractor should instruct the supplier to provide materials that are sufficient to insure that tests made at the job site will fall within the specification limits.
7. IDOT inspectors usually are assigned to the plants, quarries or other supply sources as needed. The Contractor should plan the work so that IDOT has sufficient advance notice to assign an inspector if that material inspection is required.

8. Payment for work items in which there is insufficient material documentation may be withheld until satisfactory documentation is submitted to the Resident Engineer.
9. The Resident Engineer reserves the right to request additional evidence of inspection or documentation of questionable materials.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
SECTION 40. CONTROL OF MATERIALS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 40. "Control Of Materials" is modified as outlined below:

40-01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS

ADD: After the second paragraph:

As a minimum, the Contractor shall provide, upon delivery, statements (shipment tickets, source, manufacturer's certification, analysis, sample, etc.) as required by the Illinois Department of Transportation, Division of Aeronautics "Manual for Documentation of Airport Materials - Latest Edition" or requested by the Division of Aeronautics Engineer of Materials.

No materials shall be incorporated into the work until the proper material documentation in accordance with the Standard Specifications, Supplemental Specifications, applicable Recurring Special Provisions and Contract Special Provisions has been submitted and reviewed with no exceptions taken by the Resident Engineer or the Project Engineer.

40-05 RESIDENT ENGINEER'S FIELD OFFICE

ADD: The Contractor will be required to furnish and maintain a Resident Engineer's Field Office, when required by the contract.

40-06 STORAGE OF MATERIALS

ADD: Topsoil shall be stockpiled at the locations designated by the Resident Engineer and in accordance with the approved Safety and Phasing Plan.

Stockpiled material at the construction site should be prominently marked and lighted in a manner acceptable to the Airport Management, when required by the Airport Management.

Stockpiled material should be constrained in a manner to prevent movement resulting from aircraft blast or wind conditions in excess of 10 knots.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

SECTION 50. LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 50. "Legal Relations And Responsibility To Public" is modified as outlined below:

50-04 PERMITS, LICENSES AND FEES

ADD: It will be the Contractor's responsibility to obtain permission and any applicable permits to use the roads (federal, state, county, township) leading to the airport construction site. The Contractor will be responsible for road maintenance, cleanup and any other requirements agreed upon for the right to use the roads. This requirement will be considered an incidental cost to the contract and no additional compensation will be allowed.

50-10 BARRICADES, WARNING SIGNS & HAZARD MARKERS

ADD: After the second paragraph:

Type I barricades shall be provided and conform to IDOT Division of Highways Specifications and Standards for Type I Barricades. The barricades shall be lighted with a flashing or steady-burning red light. The barricades shall be sufficiently weighted with sandbags or other appropriate method to withstand high winds or jet blast without dislocation.

Barricades shall be placed as shown in the plans or as directed by the Resident Engineer or Airport Management. The Contractor shall be responsible for supplying, maintaining and any moving of all barricades. Lights shall be maintained in proper working order. No separate payment will be made for supplying, maintaining and moving barricades but shall be considered incidental to the contract. Any cost of labor and equipment necessary to insure safety at the airport for the duration of the project will be considered incidental to the contract and no additional reimbursement for these items of work will be allowed.

ADD: After the fifth paragraph:

When any vehicle is required to travel over any portion of the aircraft movement area and runway approach area, the vehicle shall be properly identified to operate in the area or provided with a flag on a staff so attached to the vehicle so that the flag will be readily visible. The flag should be not less than 3-foot square consisting of a checkered pattern of international orange and white squares of not less than one foot on each side and displayed in full view above the vehicle. A flag or escort vehicle is not required for vehicles which have been painted, marked and lighted for routine use on aircraft movement areas. Contractor vehicles that are engaged in continuous hauling operations are not required to display a flag. Any vehicle operating on the movement area during the hours of darkness should be equipped with an amber flashing dome-type light, in accordance with local and/or state codes.

50-12 PROTECTION AND RESTORATION OF PROPERTY

ADD: The following paragraphs to this section:

The Contractor shall take special precautions during construction to protect existing pavement, graded ground, landscaping, areas with turf or sod, buildings, lights, guidance signs, NAV-AIDS, and other existing features of the airport and surrounding area from damage or disturbance. Any such areas disturbed, damaged, or destroyed by the Contractor, except those areas within the limits of construction, shall be returned to their pre-construction condition to the satisfaction of the Engineer. The cost of work necessary to accomplish these requirements shall be considered incidental to the contract and no additional compensation will be allowed.

The Contractor shall take every precaution against fire.

50-13 RESPONSIBILITY FOR DAMAGE CLAIMS

ADD: Following the first sentence of the first paragraph:

The Contractor shall also indemnify and save harmless the engineering firm retained by the Owner to provide construction inspection.

ADD: To the third paragraph:

The engineering firm retained by the Owner to provide construction inspection shall be included as an additional named insured on the certificate of insurance.

50-15 OPENING SECTIONS OF THE WORK TO TRAFFIC

ADD: It is necessary for the Contractor to complete the contract work in such a way as to maintain airfield access for all aircraft. The Contractor shall submit a progress schedule to the Project Engineer in conformance with Section 60-02 showing the estimated beginning and completion dates of each

sequence of work. It is vitally important to plan and conduct the work in such a manner that the length and amount of interruption to air traffic at the airport is minimized. If necessary to complete the work within the time limitations for the contract and the schedule approved by the Division, the Contractor shall work longer than regular hours or use multiple crews and equipment, or a combination of such techniques. Any premium costs of overtime or multiple crew and equipment operations shall be at the Contractor's expense.

50-17 CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS

ADD: After the third paragraph:

The location of the underground utilities as indicated on the plans has been obtained from existing records. Neither the Owner, Division or the Project Engineers assume any responsibility whatever in respect to the accuracy, completeness or sufficiency of the information. There is no guarantee, either expressed or implied, that the locations, size and type of material of existing underground utilities indicated are representative of those to be encountered in the construction.

It shall be the Contractor's responsibility to determine the actual location of all such facilities, including service connections to underground utilities. Prior to construction, the Contractor shall notify the utility company of his operational plans. The Contractor shall make arrangements for detailed information and assistance in locating utilities. In the event an unexpected utility interference is encountered during construction, the Contractor shall immediately notify the utility company, the Owner and the Resident Engineer. Any such mains and/or services disturbed by the Contractor's operations shall be restored immediately at his expense to the satisfaction of the utility company, Owner and the Engineer.

Should any utilities or cables require location, the following people shall be contacted:

Utility Service or Facility	Person to Contact
FAA Control & Communications Cable	Airways Facility Unit
Airfield Lighting Cables and Airport Owned Navigational Aids	Airport Management
Electric Cables	JULIE 1-800-892-0123
Telephone Cables	JULIE 1-800-892-0123
Water Lines	JULIE 1-800-892-0123

The Contractor shall be responsible for contacting any utility companies which are not members of JULIE and may have utilities in the area.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
SECTION 60. PROSECUTION AND PROGRESS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 60. "Prosecution And Progress" is modified as outlined below:

60-04 PROSECUTION AND PROGRESS

ADD: The Contractor shall notify the Resident Engineer in writing of any possible delays in delivery or availability of materials or equipment associated with this project.

60-09 FAILURE TO COMPLETE ON TIME

DELETE: Schedule of deductions for each day of overrun in contract time table.

ADD: See contract documents for current schedule of deductions.

Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver of any requirement under the contract.

ADD:

60-13 CONTRACTOR'S ACCESS TO AIRFIELD

The Contractor shall not have access to any part of the active airfield facilities (runways, aprons, or taxiways, and associated safety areas) for any equipment or personnel without the approval of the Airport Management.

The Contractor's access shall be at the locations shown in the Plans. The Contractor shall be responsible for maintaining these roads in a condition satisfactory to the Resident Engineer, Airport Management and his own access needs.

The Contractor shall provide haul road structure of his own design to suit his needs. Lack of adequate access to the site will not be an allowable consideration for an extension of time.

The Contractor shall be required to maintain security on the airport as specified or as directed by the Airport Management.

The Contractor shall be responsible for keeping all access gates closed and locked during work hours. If the Contractor chooses to leave a gate open, then he shall post a competent, properly trained security guard to prevent unauthorized entries. The Contractor shall replace any unsatisfactory security guards if so directed by the Division or Airport Management.

The Contractor shall install and maintain a heavy-duty padlock on all access gates. He shall provide keys for this padlock to the Resident Engineer, Maintenance Supervisor (where applicable), Security Chief (where applicable), and Airport Management. No additional keys are to be distributed unless authorized by the Airport Management.

The Contractor shall provide a sign at all access gates saying "Authorized Personnel Only".

All cost relating to Contractor's access and security shall be the responsibility of the Contractor.

Upon completion of construction, all areas shall be regraded, cleaned of all debris and restored to the satisfaction of the Resident Engineer and the Airport Management.

No concrete waste or wash-out shall be buried on airport property. In the event that a concrete waste or wash-out pit is constructed, inspection of the pit shall take place by the Resident Engineer after clean-out is completed and before backfilling begins.

If required by the Airport Management, the Contractor shall obtain Airport Security forms from the designated Airport Security representative. These forms shall be completed by all personnel expected to work on the Project, and submitted to Airport Management 48 hours in advance of the time the individual is scheduled to be at the work site.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
SECTION 70. MEASUREMENT AND PAYMENT

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Section 70. "Measurement And Payment" is modified as outlined below:

70-05 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK

Revise Section 70-05(2)(a) and (b) to read as follows:

- (a) Labor. For all labor (skilled and unskilled) and foreman in direct charge of a specific force account item, the Contractor shall receive the rate of wage (or scale) for every hour that such labor or foreman is actually engaged in the specified force account work to which cost (sum) an amount not to exceed 35% shall be added. Such wage (or scale) shall be agreed upon in writing before beginning the work.
- (b) Insurance and Taxes. For property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on the force account work the Contractor shall receive the actual cost, to which cost (sum) an amount not to exceed 10% will be added. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such insurance and taxes.

ADD:

(2)(h) Work Performed by an Approved Subcontractor.

When extra work is performed by an approved Subcontractor, the Contractor shall receive as administrative costs an amount equal to five (5) percent of the first \$10,000 and one (1) percent of any amount over \$10,000 of the total approved costs of such work.

70-06 PARTIAL PAYMENTS

ADD: After the last paragraph:

If, upon delivery of any of the materials, the Contractor fails to supply documentation meeting the requirements of the Illinois Department of Transportation, Division of Aeronautics "Manual for Documentation of Airport

Materials,” (latest edition), the Division shall not include payment for that material on a Contractor Progress Payment report until such statements have been furnished. Copies of the Division of Aeronautics “Manual for Documentation of Airport Materials” may be obtained by contacting the Division.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 151 CLEARING AND GRUBBING

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 151 "Clearing And Grubbing" is modified as outlined below:

DESCRIPTION

151-1.1 ADD: This item shall also consist of removal of all incidental items within the limits shown on the plans.

CONSTRUCTION METHODS

151-2.1 GENERAL

ADD: At the end of the first paragraph:

Unless otherwise specified, no cutting or trimming of trees shall occur between April 1 and September 30, both days inclusive, due to potential impact to the Indiana Bat, which is protected by the Endangered Species Act of 1973. If otherwise specified, the Contractor shall verify that the required permits have been obtained prior to the commencement of tree cutting or trimming operations.

ADD: At the end of the second paragraph:

Burning of removed vegetative material may be allowed provided such burning is in compliance with all Federal, State and Local guidelines and the Airport Management requirements. Permission to burn shall be coordinated with the Airport Management daily and when changes in weather conditions may affect the airport.

The Contractor shall procure an EPA Clean Air Permit for burning. The permit shall require an air curtain destructor at each burn pit.

Under no circumstances shall burning be allowed if it has been deemed that burning may cause an interference to airport operations. In no case shall burning be allowed within 750 feet of the centerline of any runway.

The Contractor is responsible for clean-up of burn areas.

ADD: At the end of the third paragraph.

All waste materials which are not used or burned at the site shall be removed and disposed of legally off airport property.

151-2.3 CLEARING AND GRUBBING

DELETE: 1st Paragraph.

ADD: In areas shown in the plans or as designated by the Resident Engineer to be cleared and grubbed, all stumps, roots, buried logs, brush and other unsatisfactory materials shall be removed.

ADD:

151-2.4 METAL GUARDRAIL REMOVAL

This work shall consist of the removal and disposal of existing metal guardrail at the locations designated. The guardrail shall be removed completely. The guardrail posts shall be pulled, not cut off. All holes shall be filled and compacted. The removed material shall be disposed of off airport property.

151-2.5 PIPE REMOVAL

The work shall consist of the removal of existing concrete or corrugated metal pipe including any anchor walls. Pipes shall be disposed of by the Contractor off of airport property.

Trenches resulting from the removal shall be backfilled in accordance with Item 152.

151-2.6 HEADWALL REMOVAL

This work shall consist of the removal and disposal of existing concrete headwalls and other cast in-place concrete outlet structures at the locations designated in the plans.

The headwalls shall be removed completely and disposed of off airport property. Care shall be taken by the Contractor to prevent damage to the existing pipe.

Trenches resulting from the removal shall be backfilled in accordance with Item 152.

151-2.7 END SECTION REMOVAL

This work shall consist of the removal and disposal of existing precast concrete or metal end sections. The end sections shall be removed completely and disposed of off of airport property. Care shall be taken by the Contractor to prevent damage to the existing pipe.

Trenches resulting from the removal shall be backfilled in accordance with Item 152.

151-2.8 INLET REMOVAL

This work shall consist of the removal of existing drainage structures from the locations shown in the plans. These structures shall be removed completely and the resulting waste materials shall be disposed of off of airport property

Excavations resulting from the removals shall be backfilled in accordance with Item 152.

151-2.9 CLEANOUT REMOVAL

This work shall consist of removal of existing cleanouts and the capping of the adjacent underdrain which will remain in place. The Contractor shall be required to carefully remove the existing cleanout using methods which will minimize damage to the underdrain and cap the underdrain with concrete or a plastic cap. These structures shall be removed completely and the resulting waste materials shall be disposed of off of airport property.

The excavation shall be backfilled with a material which meets the requirements of IDOT FA-02 as specified in Item 705.

151-2.10 FENCE REMOVAL

This work shall consist of the removal and disposal of existing wire fence. The fence shall be removed completely including posts and foundations. The fence posts shall be pulled, not cut off. All holes shall be filled and compacted. The removed material shall be disposed of off airport property.

151-2.11 BUILDING REMOVAL

This work shall consist of building and foundation removal. The Contractor will be allowed to burn any portion of the building in accordance with Section 151-2.1. The remainder of the building and foundation shall be disposed of by the Contractor off of airport property.

METHOD OF MEASUREMENT

151-3.1 ADD: When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

The quantities of clearing or clearing and grubbing will be measured by the acre. The entire area will be used in computing the acres. No deductions will be made for bare areas and existing roads occurring within these limits unless otherwise specified or shown on the plans

BASIS OF PAYMENT

151-4.1, 151-4.2, 151-4.3

DELETE: These sections.

ADD:

151-4.1 Payment shall be made at the contract unit price per acre for clearing and clearing and grubbing; and at the contract unit price per each for isolated tree removal when shown on the plans or directed by the Resident Engineer.

These prices shall be full compensation for removing and disposing of all materials; for excavation and backfilling; and for all labor, equipment, tools, and incidentals necessary to complete the item.

The removal of items within the clearing or clearing and grubbing limits shall be considered incidental to this item, unless shown or specified as otherwise.

Payment will be made under:

- Item AR151410 -- Clearing -- per acre.
- Item AR151420 -- Clearing Trees 0-2.5' Butt Dia. -- per each.
- Item AR151430 -- Clearing Trees 2.5'-5' Butt Dia. -- per each.
- Item AR151440 -- Clearing Trees Over 5' Butt Dia.-- per each.
- Item AR151450 -- Clearing and Grubbing -- per acre.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 152 EXCAVATION AND EMBANKMENT

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 152 "Excavation And Embankment" is modified as outlined below:

DESCRIPTION

152-1.1 ADD: This item shall consist of all topsoil stripping, excavation and undercutting, embankment, final shaping, topsoiling, pavement shoulder construction, grading and compacting necessary to construct the proposed embankments in conformance with the lines and grades shown in the plans and in conformance with the specifications.

The Contractor is required to test the existing soils and provide the Resident Engineer with the maximum dry density and optimum moisture. All associated labor, equipment, materials and incidentals associated with obtaining the Proctor information is considered incidental to Item AR152410.

Upon completion of the embankments, the Contractor shall grade all areas to drain.

152-1.2 CLASSIFICATION

DELETE: Entire Section.

ADD: All material excavation, regardless of source, including vegetation stripping and shoulder construction shall be defined as "Unclassified Excavation" unless designated otherwise.

When provided for in the proposal, Borrow Excavation shall consist of all excavation made outside of the normal grading limits but on airport property.

All material hauled to the construction site from an offsite source for embankment other than shoulder adjustment shall be classified as "Offsite Borrow Excavation".

All excavation associated with shoulder adjustment adjacent to the pavement improvements regardless of source and including vegetation stripping, shall be classified as "Shoulder Adjustment" and shall be measured as such.

CONSTRUCTION METHODS

152-2.2 EXCAVATION

DELETE: "and has staked out the proposed work" from the second sentence of the first paragraph.

ADD: At the end of the second paragraph:

Selective Grading Will Be Required.

DELETE: All references to "common excavation and solid rock excavation."

DELETE: The 8th paragraph.

ADD: Excavation and embankment shall be compacted to a density of not less than the percentage of the maximum density, at optimum moisture, shown in Table 1 as determined by the compaction control tests cited in Division VII for ASTM D698 (Standard Proctor) for Aircraft weights of less than 60,000 pounds and for ASTM D1557 (Modified Proctor) for aircraft weights of 60,000 pounds or more.

In cut areas the top 6" of subgrade shall be compacted to a density of not less than the percentage of the maximum density shown in Table 1, at optimum moisture, as determined by the compaction control tests cited in Division VII.

TABLE 1: COMPACTION REQUIREMENTS

LOCATION	CUT (TOP 8" OF SUBGRADE)	FILL
Below Proposed Airfield Pavements	95%	95%
Below Proposed Vehicle Roadways & Paved Shoulders ASTM D698 – Standard	95%	95%
Embankments Outside Pavement Limits ASTM D698 – Standard	N/A	90%
Shoulder Adjustments less than 6" compacted thickness	3 Passes of a Sheepsfoot Roller	3 Passes of a Sheepsfoot Roller

In cut sections, if necessary, the Contractor shall take the following steps in an effort to obtain not less than 95% of the standard laboratory density in the subgrade.

- A. Step 1. Cut plan ditches which drain the area at least to grade. This shall be done at least two weeks prior to Step 2.
- B. Step 2. Air dry the top 200 mm (8-inches) of subgrade. This procedure shall include at least two 200 mm (8-inch) depth processing utilizing discs or tillers each day for 3 consecutive good drying days.

- C. Step 3. Recompact the layer processed in Step 2 to achieve not less than 95% density, or until at least 9 passes of a roller which has demonstrated ability to obtain the density on adjacent earthwork have been made.

Stockpiling of unclassified excavated material including topsoil for later use shall be done at the Contractor's expense.

152-2.4 DITCH EXCAVATION

DELETE: The last sentence of the 2nd paragraph.

ADD: The Contractor shall construct temporary channel relocations to divert storm water from the locations of proposed drainage structures. These channel relocations shall be at the location and of a cross section designed by the Contractor. Excavation for the temporary channel relocations shall not be measured for payment.

152-2.5 PREPARATION OF EMBANKMENT AREAS

DELETE: The third paragraph.

ADD: Where embankments are to be constructed against existing slopes which are 3:1 or steeper, steps or benches, a minimum of 10' wide shall be cut into the existing slope as each layer of new embankment material is being placed and spread. Material excavated by the benching process shall be incorporated into the embankment and shall not be measured for payment.

ADD: For overlays, prior to paving, the existing one foot (1) width of turf adjacent to the pavement edges shall be peeled back away from the pavement edge to facilitate paving and milling operations. No additional compensation for this work shall be made, but shall be considered incidental to shoulder adjustment. Prior to construction of shoulder adjustment, the existing turf shall be thoroughly disced or tilled. No additional compensation for this work shall be made, but shall be considered incidental to shoulder adjustment.

152-2.6 STRIPPING

DELETE: Second and third sentences of the first paragraph.

ADD: Obviously compressible and/or organic materials shall be removed down to dense material as directed by the Resident Engineer, and replaced with suitable embankment material. The cost of this work, should it occur, will be measured and be paid for as Unclassified Excavation.

Stripping of vegetation and crop root structures shall not be measured separately for payment, but shall be considered incidental to UNCLASSIFIED EXCAVATION. Portions of the excavation acceptable to the Engineer may be reused as shoulder fill outside of the proposed pavement limits, as shown

on the typical sections in the plans. Material accepted as shoulder fill shall be free of heavy sods, crop root structures, decayed vegetative matter, rubbish and other unsuitable material. All other excavated material shall be used in earth berms or disposed of as directed by the Resident Engineer.

152-2.7 FORMATION OF EMBANKMENTS

DELETE: The fifth paragraph and the twelfth paragraph.

ADD: Rolling operations shall be continued until the embankment is compacted to not less than the percentage of the maximum density, at optimum moisture, shown in Table 1.

Below proposed and future pavements: Embankment placed shall not contain more than 120 percent nor less than 90 percent of optimum moisture determined in accordance with ASTM D 2216.

All soft and yielding materials or materials which displace or "pump" under construction traffic shall be re-worked or replaced as directed by the Engineer. The cost of re-working shall be considered incidental to this item.

All shoulder embankment shall be constructed using topsoil or other acceptable excavated material. Moisture and density control will not be required for shoulder embankment less than six inches in compacted thickness or for topsoil, but such embankment shall be compacted by a minimum of three passes of a sheepsfoot roller to the satisfaction of the Engineer.

152-2.9 PREPARATION AND PROTECTION OF THE TOP OF THE SUBGRADE

DELETE: Third sentence of first paragraph.

ADD: After all drains, structures, ducts, and other underground appurtenances under the pavement have been completed, the subgrade shall be compacted to the density specified.

152-2.10 HAUL

ADD: The Contractor shall take special precautions when hauling excavated material so as not to create deep ruts in the hauling areas designated by the Project Engineer. All existing graded, turfed, sodded and/or farmed areas which are disturbed or rutted by the Contractor, during all of his hauling operations, shall be regraded, returfed and refinished at his own expense and to the satisfaction of the Engineer. No claim for haul will be allowed the Contractor.

The Contractor will not be allowed to haul any materials across areas which are currently in crops and are designated by the Airport Management to be used for agriculture or which have been recently seeded under this or a previous contract.

152-2.12 TOPSOIL

DELETE: From the second sentence of the second paragraph:

"The Resident Engineer shall set grade stakes for"

ADD: To the second sentence of the second paragraph:

"The Contractor shall set grade stakes for ..."

DELETE: Fifth Paragraph.

ADD: Any excess topsoil material shall be hauled to an onsite stockpile location determined by the Airport Management at no additional cost to the contract.

All stockpiles left in place as directed by the Resident Engineer shall be shaped to non-uniform, smooth, site-complimentary lines prior to seeding. The cost of seeding stockpiles shall be incidental to Unclassified Excavation.

Debris or other materials not suitable for use in earth embankment, as determined by the Resident Engineer, shall be disposed of off the airport property.

Excavation shall be paid for only once. Stockpiling of topsoil for later reuse and redistribution shall be done at the Contractor's expense. Stockpiling necessary for respreading on shoulders, embankments, cut or borrow areas shall be considered incidental to the unit price bid for excavation.

152-2.13 FIELD TILE

ADD: Any farm drain tile or other underground construction encountered in the work shall be located and staked and reported to the Resident Engineer in writing. Any drainage lines which are cut or damaged by grading, trenching, excavation or other construction activities shall be repaired and connected to the proposed storm sewer system, where practical, by the Contractor at his expense in such manner as to render the lines usable for the purpose intended.

152-2.14 WORK AREA CONDITIONS

If work area conditions become such that the health and safety of the Contractor's workers, the engineers, or the public are affected, the Contractor shall rectify the condition through watering, discing or blading of the work area or other suitable method, as approved by the Resident Engineer. This maintenance cost shall be considered incidental to the contract. As a minimum, Federal, State and Local laws, rules and regulations concerning construction safety and health standards shall be enforced.

METHOD OF MEASUREMENT

152-3.1 ADD: Before any work is started which would affect the measurements, the earthwork contractor shall verify all earthwork quantities shown in the plans are in agreement with earthwork quantities from his own calculations. The Contractor shall notify the Engineer of any discrepancies in quantities.

When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Resident Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

152-3.2 DELETE: This section.

152-3.3 Revise this section to read:

All borrow excavation with the exception of borrow excavation required for shoulder adjustment to be paid for shall be the number of cubic yards measured in its final compacted position and pay quantities shall be computed by the method of average end areas.

ADD:

152-3.4 Shoulder adjustment measured for payment shall be the number of square yards measured in its final position at the locations shown in the plans or as directed by the Engineer. No measurement for payment shall be made for topsoil stripping, spreading and excavation associated with the shoulder adjustment.

BASIS OF PAYMENT

152-4.1 ADD: Payment for "Unclassified Excavation" shall also include removal of unsuitable materials, if any, at the discretion of the Engineer and required excavation of onsite stockpiles for shoulder fill.

Payment will be made at the contract unit price per cubic yard measured in initial position for "Unclassified Excavation". This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to satisfactorily complete the item.

Payment will be made at the contract unit price per cubic yard measured in its final position for "Borrow Excavation" and "Offsite Borrow Excavation". This price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to satisfactorily complete the item.

Payment shall be made at the contract unit price per square yard for shoulder adjustment. This price shall be full compensation for topsoil stripping, stockpiling and spreading, excavation and for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2, 4.3, 4.4

DELETE: These Sections.

Payment will be made under:

- Item AR152410 -- Unclassified Excavation -- per cubic yard.
- Item AR152440 -- Borrow Excavation -- per cubic yard.
- Item AR152442 -- Offsite Borrow Excavation -- per cubic yard.
- Item AR152480 -- Shoulder Adjustment -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 155 LIME TREATED SUBGRADE

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 155 "Lime Treated Subgrade" is modified as outlined below:

DESCRIPTION

155-1.1 Revise this section to read as follows:

This item shall be considered as lime modified subgrade and all references to lime treated subgrade in Item 155 of the Standard Specifications shall be construed as lime modified subgrade. This item shall consist of constructing a course of soil, by-product lime and water mixture of the thickness shown in the plans and in accordance with these specifications. The final grade shall be constructed to the elevations that will allow the finished pavement elevation shown on the construction plans. The lime-modified subgrade will be completed prior to the placement of the proposed pavements.

ADD:

155-1.2 Any references to lime or hydrated lime in this specification shall be considered as referring to by-product lime (kiln dust), as approved by the Engineer.

It is the Contractor's responsibility to account for any "fluff" in the lime-modified subgrade. The Contractor will account for it in the pre-cutting of the subgrade and the final grading of the subgrade. Excess material will be disposed of on the airport site as directed by the Resident Engineer. Excess material shall not be placed within 6 inches of finished grade.

MATERIALS

155-2.1 HYDRATED LIME

DELETE: This section.

155-2.2 COMMERCIAL LIME SLURRY

DELETE: This section.

155-2.4 SOIL

DELETE: First sentence.

ADD: The soil for this work shall consist of embankment or existing soil materials which are in-place at the location shown for the lime modified soil in the typical sections, or as directed by the Resident Engineer.

155-2.5 BY-PRODUCT LIME

ADD: By-product lime shall comply with the following requirements:

- (1) Total calcium and magnesium oxides (nonvolatile basis) minimum percent = 65
- (2) Available calcium hydroxide (rapid sugar test, ASTM C25) plus total MgO content calculated to be an equivalent Ca(OH)_2 min. percent = 41

NOTE: Percent available $\text{Ca(OH)}_2 + (\% \text{MgO}) (1.828) =$ percent equivalent available Ca(OH)_2

Where the available Ca(OH)_2 is above the minimum indicating high calcium lime, determination of the MgO is not necessary.

- (3) Loss on ignition (carbon dioxide plus moisture, combined and free) on as-received basis:

If sample is taken at the place of manufacture max. percent = 35

If sample is taken at any other place max. percent = 40

- (4) Free Water (as-received basis) max. percent = 4
- (5) Residue. The sieve analysis of the hydrated by-product lime shall be as follows:

SIEVE	MAX % RETAINED
No. 4	0
No. 30	2.5
No. 100	15

Prior to delivering lime to the project, the Contractor shall submit to the Engineer certification from the by-product lime supplier that the hydrated by-product lime provided to the project conforms to the requirements herein and that the supplier is an IDOT Division of Highways approved source for Hydrated By-Product Lime.

COMPOSITION

155-3.1 LIME

ADD: By-product lime shall be applied at an approximate rate of 5 percent lime by dry soil weight, based on maximum theoretical density. For the assumed subgrade soil types, this would equate to approximately 4.0 pounds of by-product lime per square yard per inch of depth. The actual proportions of lime, soil and water will be set by the Contractor before work begins. The Engineer reserves the right to make such adjustments of lime proportioning as are considered necessary during the progress of the work within a range of $\pm 2\%$, without additional compensation to the Contractor. Source of type of lime shall not be changed during the progress of the work without permission of the Engineer. The right is reserved by the Engineer to make such changes in proportions during the progress of the work, as he may consider necessary.

The optimum moisture content and standard dry density of the lime-modified soil shall be determined in accordance with ASTM D698 for aircraft weighing less than 60,000 lbs. And in accordance with ASTM D1557 for aircraft weighing 60,000 lbs. and more.

WEATHER LIMITATIONS

155-4.1 WEATHER LIMITATIONS

CHANGE: The first sentence to read:

"Lime shall not be applied or mixed while ..."

ADD: The amount of lime modified soil constructed shall be limited to that which can be covered within the same construction season, unless otherwise permitted by the Engineer.

EQUIPMENT

155-5.1 EQUIPMENT

ADD: The following to this section:

Equipment shall meet the following requirements:

- (a) Three Wheel Roller - The roller shall be self-propelled; capable of being operated smoothly and without jerking when starting, stopping, or reversing directions; and free from backlash, loose link motion, faulty steering mechanism and worn king bolts. The steering mechanism shall have no lost motion, shall operate readily, and permit the roller to be directed on the alignment desired.

Roller wheels shall be smooth and free from openings or projections that could mar the surface on which the roller is operated. Motor rollers shall be equipped with drip pans designed to prevent oil, grease or gasoline from dropping upon the surface. The roller shall be provided with adjustable

scrapers that shall be used when necessary to keep the surface of the wheels clean.

The rear wheels of three-wheel rollers may be crowned at the rate of not more than 1/16 inch in 20 inches and shall be propelled with a differential gear. The front wheel shall be divided into at least two sections, shall show no noticeable crown, and shall overlap the compression area of each rear wheel by not less than 2-1/2 inches. The roller shall weigh not less than 6 tons nor more than 12 tons and shall have a compression on the drive wheels of not less than 190 pounds nor more than 400 pounds per inch width of roller.

The Contractor shall provide means for determining the weight of the roller as distributed on each axle. Ballast will be included in determining the weight.

- (b) Tandem Roller - The roller shall be self propelled; capable of being operated smoothly and without jerking when starting, stopping or reversing directions; and free from backlash, loose link motion, faulty steering mechanism and worm king bolts. The steering mechanism shall have no lost motion, shall operate readily, and permit the roller to be directed on the alignment desired. Roller wheels shall be smooth and free from openings or projections that could mar the surface on which the roller is operated. Motor rollers shall be equipped with drip pans designed to prevent oil, grease or gasoline from dropping upon the surface. The roller shall be provided with adjustable scrapers that shall be used when necessary to keep the surface of the wheels clean.

The rear wheel may be crowned at the rate of not more than 3/16 inch in 4-1/2 feet. The front wheel shall be divided into at least two sections and shall show no noticeable crown. The roller shall weigh not less than 6 tons nor more than 12 tons and shall have a compression on the drive wheels of not less than 190 pounds nor more than 400 pounds per inch width of roller.

The Contractor shall provide means for determining the weight of the roller as distributed on each axle. Ballast will be included in determining the weight.

- (c) Tamping Roller - The roller, under working conditions, shall have a minimum weight of 90 pounds per inch width of drum, and each individual tamper shall develop a compression of not less than 100 pounds per square inch of its tamping face area. The width of the tamping roller shall be not less than 8 feet, and it shall be constructed in two or more sections in such a manner that each section is free to oscillate or move independently. It shall be equipped with cleaning teeth at the rear. It shall also be equipped with a vibratory mode with 1600 vibrations per minute (VPM).
- (d) Pneumatic-Tire Roller - the roller shall consist of not less than 9 pneumatic tires revolving on 2 axles. The tires on the front and rear wheels shall be

staggered so that they will cover the entire area over which the roller travels. Under working conditions, the roller shall develop a compression of not less than 225 pounds per inch width of tire tread.

- (e) Vibratory Roller - The roller shall be self-propelled and meet the following minimum requirements: drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM), unit static force on vibrating drum(s) 125 pounds per linear inch (PLI), total applied force 325 pounds per linear inch (PLI), adjustable eccentrics, reversible eccentrics on nondriven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller.
- (f) Disc Harrow - the disk harrow shall be the tandem type and shall meet the approval of the Resident Engineer prior to its use. It shall be of sufficient size and weight to perform the manipulation required.
- (g) Rotary Speed Mixer - Rotary speed mixers shall be either the power takeoff or the self-powered type, equipped with a hydraulic lift. Worn scarifying and mixing parts shall be replaced and extra parts shall be available for replacement.
- (h) Traveling Mixing Plant - All traveling mixing plants shall meet the approval of the Resident Engineer. The plants shall be either of the type that will pulverize the material to be modified and mix the material and cement with the proper amount of water without picking the materials up from the roadway, or of the pugmill type which elevates the material into a pugmill for mixing. The plant shall be equipped with a device that will accurately control and measure the quantity of water used. Worn scarifying and mixing parts shall be replaced and extra parts shall be available for replacement.
- (i) Distributor - Distributor for spreading lime shall be cyclone, screw-type or pressure manifold type, as approved by the Engineer.

CONSTRUCTION METHODS

155-6.1 GENERAL

DELETE: The second, third, and fourth sentence of the second paragraph.

ADD: Prior to beginning any lime treatment in the area designated for the lime modified subgrade, the area shall be trimmed to grade (+0.00' to -0.10') by means approved by the Engineer as specified in Item 152.

DELETE: The third paragraph.

155-6.2 APPLICATION

ADD: To Paragraph (a), Dry Placing:

The surface of the grade shall be lightly scarified or disced prior to distribution of the lime. The lime shall then be distributed uniformly over the surface. The Engineer may reject any procedure which does not provide even distribution of lime. In the event that rain intervenes, causing cessation of work and exposure of the lime to washing or blowing, the Engineer may require additional lime to be spread at no cost to the Contract.

The lime shall be disced, if required, to prevent dusting as directed by the Engineer.

During the interval of time between application and mixing, lime that has been exposed to the open air for a period of 6 hours or more, or to excessive loss due to washing or blowing, shall be replaced by the Contractor at his expense.

DELETE: Paragraph (b), Slurry Placing.

155-6.3 MIXING

DELETE: This section.

ADD: The use of a rotary speed mixer or traveling mixing plant is required. The lime, existing soil and water shall be thoroughly mixed and blended by approved mixers or other equipment approved by the Engineer, and the mixing continued until, in the opinion of the Engineer, a homogenous mixture is obtained. The Contractor shall demonstrate to the Engineer that the equipment is capable of mixing to the full depth specified prior to beginning full production.

155-6.4 COMPACTION

ADD: To the end of the first paragraph:

Compaction shall be started immediately after mixing, unless approved by the Engineer. If compaction is to be delayed, the surface of the lime modified soil shall be sealed by light rolling immediately after mixing.

Delete the second paragraph and substitute the following:

Compaction shall begin at the bottom and shall continue until the entire depth is uniformly compacted. The entire thickness of the modified subgrade shall be compacted to a density of not less than 95% of the standard dry density. The standard dry density of the lime-modified soil shall be determined in accordance with ASTM D698 for aircraft weighing less than 60,000 lbs. and in accordance with ASTM D1557 for aircraft weighing 60,000 lbs. and more. Field density shall be determined in accordance with ASTM D1556, D2167, D2922 or other methods approved by the Engineer. If proper compaction and stability are not achieved, the contractor will reprocess and compact the failing areas.

155-6.5 FINISHING AND CURING

DELETE: The first sentence of the second paragraph.

ADD: Once the specified density of the lime- soil mixture is achieved, the Contractor may start final trimming operations and placement of the overlying course if the compacted lime modified layer is not rutted or distorted by the equipment.

The Contractor shall keep the lime-soil mixture moist cured for a minimum of seven (7) days by watering or by placement of the overlying course.

The surface shall be maintained in a moist condition by means of a fine spray during all finishing operations and throughout the curing period.

Upon completion of compaction operations the Contractor shall be required to trim the lime modified soil to finish subgrade elevations.

METHOD OF MEASUREMENT

155-7.1 DELETE: This section.

ADD: The quantity of lime to be paid for shall be the number of tons of material placed, blended, and accepted in the completed subbase but not in excess of 105 percent of the amount specified. The lime shall be weighed either at the place of loading in the trucks, at the place of unloading of the trucks, or at such other point as the Resident Engineer may designate. The Contractor shall furnish approved duplicate load tickets upon which is recorded the net weight of the lime in each truck. The Contractor shall submit one (1) load ticket to the Resident Engineer, or his duly authorized representative, at the job site when the truck load is incorporated into the subbase.

The Contractor shall furnish or arrange for the use of scales of a type approved by the Resident Engineer.

The yardage of soil processing of the depth shown on the plans to be paid for shall be the number of square yards processed, completed and accepted.

Measurement shall not include the quantities used in areas outside the limits shown in the plans or designated by the Engineer.

BASIS OF PAYMENT

155-8.1 DELETE: This section.

ADD: Payment will be made at the contract unit price per ton for the lime; at the contract unit price per square yard for the lime processing of the thickness specified. These prices shall be full compensation for furnishing all material, water, lime, and for all mobilization, preparation, delivering, placing

and mixing these materials, and all labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

- Item AR155540 -- By-Product Lime -- per ton.
- Item AR155606 -- Soil Processing - 6" -- per square yard.
- Item AR155608 -- Soil Processing - 8" -- per square yard.
- Item AR155612 -- Soil Processing - 12" -- per square yard.
- Item AR155616 -- Soil Processing - 16" -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 208 AGGREGATE BASE COURSE

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 208 Aggregate Base Course is modified as outlined below:

DESCRIPTION

208-1.1 Rewrite the first sentence of this paragraph as follows:

“This item shall consist of a granular base course composed of coarse aggregate as specified.”

MATERIALS

DELETE: Item 208-2.1 Partially Crushed Coarse Aggregate, and replace it with the following:

208-2.1 UNCRUSHED COARSE AGGREGATE

The base course material shall consist of hard, durable particles or fragments of stone or gravel mixed or blended with sand, stone dust, or other similar binding or filler materials produced from approved materials of the same source. All oversized stones, rocks and boulders occurring in the pit or quarry material shall be wasted; those of acceptable quality may be crushed and become a part of the base material, provided the blend meets the specified gradations. The aggregate shall be free from vegetation, lumps, or excessive amounts of clay and other objectionable substances.

If approved by the Engineer, uncrushed coarse aggregate may be produced by blending aggregates from more than one source, provided the method of blending results in a uniform product. The components of this blend need not be of the same kind of material. The source of material shall not be changed during the progress of work without written permission from the Engineer. Where natural aggregate is deficient in fines, the material added to make up deficiencies shall be a material approved by the Engineer.

The uncrushed course aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT D Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	25
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

208-2.2 CRUSHED COARSE AGGREGATE

Replace the first paragraph with the following:

The crushed coarse aggregate shall be crushed stone, crushed gravel, partially crushed gravel, crushed slag, or crushed concrete as described below:

- (a) Crushed Stone. Crushed stone shall be the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanocrystalline igneous rocks, limestone, dolomite, sandstone, or massive metamorphic quartzite, or similar rocks.
- (b) Crushed Gravel. Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a one inch screen. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.
- (c) Partially Crushed Gravel. Partially crushed gravel shall consist of crushed gravel mixed or blended with sand or other similar binding or filler materials produced from approved materials of the same source.

If approved by the Engineer, partially crushed gravel may be produced by blending of aggregates from more than one source, provided the method of blending results in a uniform product. The components of this blend need not be of the same kind of material. The source of material shall not be changed during the progress of the work without written permission from the Engineer. Where natural aggregate is deficient in fines, the material added to make up deficiencies shall be a material approved by the Engineer.

- (d) Crushed Slag. Crushed slag shall be the graded product resulting from the processing of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and alumino-silicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace. It shall be air cooled and shall have a compact weight (ASTM C29) of not less than 70 lb/cu. ft. (1100 kg/m³).

- (e) Crushed Concrete. Crushed concrete shall be the angular fragments resulting from crushing portland cement concrete by mechanical means. The acceptance and use of crushed concrete shall be according to the latest Bureau of Materials and Physical Research policy memorandum. Evidence of this acceptance must be provided to the Resident Engineer.

The crushed coarse aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT D Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	25
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

The aggregate shall be free from vegetation, lumps, or excessive amounts of clay and other objectionable substances.

DELETE: The second, third, and fourth paragraphs of Item 208-2.2.

Replace the fifth paragraph of 208-2.2 with the following:

All material passing the No. 4 mesh (4.75 mm) sieve produced in the crushing operation of either stone, slag, or gravel shall be incorporated in the base material to the extent permitted by the gradation requirements.

208-2.3 GRADATION

CHANGE: Gradations "B" and "C" in Table 1 to the following:

SIEVE	<u>B</u> 1 1/2" MAX.	<u>C</u> 1" MAX.
1 1/2 Inch (37.5 mm)	100	--
1 Inch (25 mm)	90-100	100
3/4 Inch (19 mm)	--	90 – 100
1/2 Inch (12.5 mm)	60-90	65 – 95
No. 4 (4.75 mm)	30-56	40 – 60
No. 16 (1.18 mm)	10-40	15 – 45
No. 200 (0.075 mm)	4-12	5 – 13
IDOT Gradations	CA-6	CA-10

REPLACE: The third and fourth paragraphs of 208-2.3 with the following:

The amount of the fraction of material passing the No. 200 mesh (0.075 mm) sieve shall not exceed one-half the fraction passing the No. 40 mesh (0.45 mm) sieve. The portion of the filler and binder, including any blended material passing the No. 40 (0.45 mm) mesh sieve shall have a liquid limit not more than 25 and a plasticity index not more than 6 when tested in accordance with ASTM D 4318.

CONSTRUCTION METHODS

208-3.6 FINISHING AND COMPACTING.

ADD: The following paragraph after the first paragraph of 208-3.6:

The aggregate base course shall be accepted for density by the Resident Engineer or his/her representative. The in-place field density shall be determined in accordance with ASTM D1556, D2167 or D2922. The acceptance testing frequency is a minimum of one density test per 1500 square yards per lift of aggregate.

208-3.8 THICKNESS CONTROL.

DELETE: This section.

ADD:

208-3.8 THICKNESS CONTROL.

The aggregate base course shall be constructed to the thickness shown in the plans. Four determinations of thickness shall be made for each lot of material placed. The lot size shall consist of 6,000 square yards. Each lot shall be divided into four equal sublots. One test shall be made for each subplot. Sampling locations will be determined by the Engineer on a random basis. Where the thickness is deficient by more than 10 %, the Contractor shall correct such areas at no additional cost by excavating to the required depth and replacing with new material; however, the surface elevation of the completed aggregate base course shall not exceed by more than 3/16 inch the surface elevation shown on the plans or authorized by the Engineer. Additional test holes may be required to identify the limits of the deficient areas.

METHOD OF MEASUREMENT

208-4.1 DELETE: This Section.

ADD:

208-4.1 When specified or shown in the plans, the quantity of aggregate base course to be paid for shall be the number of tons of base course material placed and accepted. The aggregate shall be weighed either at the place of loading in the trucks, at the place of unloading from the trucks, or at such other points that the Resident Engineer may designate. The Contractor shall furnish approved duplicate load tickets upon which is recorded the net weight of the aggregates in each truck. The Contractor shall submit one (1) load ticket to the Resident Engineer, or his duly authorized representative, at the job site when the truck load is incorporated into the base. If at the time the aggregates are weighed they contain more than three (3) per cent of absorbed and free moisture by

weight, a deduction for the moisture in excess of this amount shall be made in determining the pay quantity.

The Contractor shall furnish or arrange for the use of scales of a type approved by the Resident Engineer.

ADD:

208-4.2 When specified or shown in the plans, the aggregate base course will be measured by the square yard of the thickness specified in place, completed and accepted. The Contractor shall furnish approved duplicate load tickets upon which is recorded the net weight of the aggregates in each truck. The Contractor shall submit one (1) load ticket to the Resident Engineer, or his duly authorized representative, at the job site when the truck load is incorporated into the base.

BASIS OF PAYMENT

208-5.1

Payment will be made under:

- Item AR208510 -- Aggregate Base Course -- per ton.
- Item AR208604 -- 4" Aggregate Base Course -- per square yard.
- Item AR208605 -- 5" Aggregate Base Course -- per square yard.
- Item AR208606 -- 6" Aggregate Base Course -- per square yard.
- Item AR208608 -- 8" Aggregate Base Course -- per square yard.
- Item AR208610 -- 10" Aggregate Base Course -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 209 CRUSHED AGGREGATE BASE COURSE

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 209 “Crushed Aggregate Base Course” is modified as outlined below:

MATERIALS

209-2.1 REPLACE: The first paragraph with the following:

The crushed coarse aggregate shall be crushed stone, crushed gravel, or crushed concrete as described below:

Crushed Stone. Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel. Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushed gravel, all of which before crushing will be retained on a 1 inch screen. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Crushed Concrete. Crushed concrete shall be the angular fragments resulting from crushing portland cement concrete by mechanical means. The acceptance and use of crushed concrete shall be according to the latest Bureau of Materials and Physical Research policy memorandum. Evidence of this acceptance must be provided to the Resident Engineer.

DELETE: The second paragraph and replace with the following:

“The crushed stone shall consist of hard, durable particles or fragments of stone, free from dirt or other objectionable matter.”

REPLACE: The third and fourth paragraphs with the following:
The crushed coarse aggregate shall conform to the following quality requirements:

QUALITY TEST(IDOT D Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	25
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

The aggregate shall be free from vegetation, lumps, or excessive amounts of clay and other objectionable substances.

209-2.3 GRADATION

CHANGE: Gradations "B" and "C" in Table 1 to the following:

SIEVE	<u>B</u> 1 1/2" MAX.	<u>C</u> 1" MAX.
1 1/2 Inch (37.5 mm)	100	--
1 Inch (25 mm)	90-100	100
3/4 Inch (19 mm)	--	90 – 100
1/2 Inch (12.5 mm)	60-90	65 – 95
No. 4 (4.75 mm)	30-56	40 – 60
No. 16 (1.18 mm)	10-40	15 – 45
No. 200 (0.075 mm)	4-12	5 – 13
IDOT Gradations	CA-6	CA-10

CONSTRUCTION METHODS

209-3.5 PLACING AND SPREADING

ADD: The following after 209-3.5 Placing and Spreading as the first paragraph:

The crushed aggregate base course material shall contain the optimum amount of moisture prior to placement. The water and aggregate shall be mixed in a pugmill mixer approved by the Engineer."

The aggregate shall be free from vegetation, lumps, or excessive amounts of clay and other objectionable substances.

209-3.6 FINISHING AND COMPACTING

ADD: The following paragraph after the first paragraph of 209-3.6:

The aggregate base course shall be accepted for density by the Resident Engineer or his/her representative. The in-place field density shall be determined in accordance with ASTM D1556, D2167 or D2922. The acceptance testing frequency is a minimum of one density test per 1500 square yards per lift of aggregate.

209-3.8 THICKNESS.

DELETE: This section.

ADD:

209-3.8 THICKNESS CONTROL.

The aggregate base course shall be constructed to the thickness shown in the plans. Four determinations of thickness shall be made for each lot of material placed. The lot size shall consist of 6,000 square yards. Each lot shall be divided into four equal sublots. One test shall be made for each subplot. Sampling locations will be determined by the Engineer on a random basis. Where the thickness is deficient by more than 10 %, the Contractor shall correct such areas at no additional cost by excavating to the required depth and replacing with new material; however, the surface elevation of the completed aggregate base course shall not exceed by more than 3/16 inch the surface elevation shown on the plans or authorized by the Engineer. Additional test holes may be required to identify the limits of the deficient areas.

METHOD OF MEASUREMENT

209-4.1 DELETE: This Section.

ADD:

209-4.1 When specified or shown in the plans, the quantity of crushed aggregate base course to be paid for shall be the number of tons of base course material placed and accepted. The aggregate shall be weighed either at the place of loading in the trucks, at the place of unloading from the trucks, or at such other points that the Resident Engineer may designate. The Contractor shall furnish approved duplicate load tickets upon which is recorded the net weight of the aggregates in each truck. The Contractor shall submit one (1) load ticket to the Resident Engineer, or his duly authorized representative, at the job site when the truck load is incorporated into the base. If at the time the aggregates are weighed, they contain more than three (3) per cent of absorbed and free moisture by weight, a deduction for the moisture in excess of this amount shall be made in determining the pay quantity.

The Contractor shall furnish or arrange for the use of scales of a type approved by the Resident Engineer.

ADD:

209-4.2 When specified or shown in the plans, the crushed aggregate base course will be measured by the square yard of the thickness specified in place, completed and accepted. The Contractor shall furnish approved duplicate load tickets upon which is recorded the net weight of the aggregates in each truck. The Contractor shall submit one (1) load ticket to the Resident Engineer, or his duly authorized representative, at the job site when the truck load is incorporated into the base.

BASIS OF PAYMENT

209-5.1

Payment will be made under:

- Item AR209510 -- Crushed Aggregate Base Course -- per ton.
- Item AR209604 -- Crushed Agg. Base Course – 4” -- per square yard.
- Item AR209606 -- Crushed Agg. Base Course – 6” -- per square yard.
- Item AR209607 -- Crushed Agg. Base Course – 7” -- per square yard.
- Item AR209608 -- Crushed Agg. Base Course – 8” -- per square yard.
- Item AR209609 -- Crushed Agg. Base Course – 9” -- per square yard.
- Item AR209610 -- Crushed Agg. Base Course – 10” -- per square yard.
- Item AR209611 -- Crushed Agg. Base Course – 11” -- per square yard.
- Item AR209612 -- Crushed Agg. Base Course – 12” -- per square yard.
- Item AR209613 -- Crushed Agg. Base Course – 13” -- per square yard.
- Item AR209617 -- Crushed Agg. Base Course – 17” -- per square yard.
- Item AR209618 -- Crushed Agg. Base Course – 18” -- per square yard.
- Item AR209624 -- Crushed Agg. Base Course – 24” -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 217 AGGREGATE-TURF PAVEMENT

RESERVED

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 304 CEMENT TREATED BASE COURSE

RESERVED

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 402 POROUS FRICTION COURSE

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 402 "Porous Friction Course (PFC)" is modified as outlined below:

DESCRIPTION

402-1.1 DESCRIPTION

DELETE: Second and third paragraphs and replace with the following:

"The porous friction course shall be constructed in one layer, having a compacted nominal thickness as shown on the plans.

No porous friction course shall be constructed until the underlying surface has been cleaned, prepared and accepted by the Resident Engineer.

The contractor shall be responsible for the quality control in the production and construction of the porous friction course."

MATERIALS

402-2.1 AGGREGATE

"Aggregate shall consist of crushed stone blended with natural or manufactured sand and/or mineral filler.

The portion of the materials retained on the No. 8 sieve shall be known as course aggregate the portion passing the No.8 sieve and retained on the No. 200 sieve as fine aggregate and the portion passing the No. 200 sieve as mineral filler.

Course aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST (IDOT B Quality)	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Fine Aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product that is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen, or electric furnace.

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Material ASTMI C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 percent clay (2 micron or smaller) particles.

[2] Does not apply to stone sand.

DELETERIOUS TEST (IDOT B Quality)	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

402-2.3 BITUMINOUS MATERIAL

DELETE: This section and replace with the following:

The bituminous material for the porous friction course shall be polymer modified and shall be SBS PG 70-28.

COMPOSITION

402-3.1 COMPOSITION OF MIXTURES

INSERT: The following as the second paragraph:

An anti-stripping agent is required for this project. A heat-stable anti-strip additive shall be required in the manufacture of mix used in the construction of the porous friction course. The anti-strip additive shall come from a producer on the Department's latest list of approved HMA anti-strip additives. The dosage rate shall be 1.0 percent by weight of asphalt cement. The Engineer shall approve the method of adding the anti-strip additive to the mix. No additional compensation shall be allowed to the contractor as payment for furnishing and using an anti-strip agent.

402-3.2 JOB MIX FORMULA

DELETE: The second paragraph and replace with the following:

The combined aggregate shall be of such size, that the percentage composition by weight as determined by laboratory sieves, will conform to the gradation shown in table 2, 1/2 inch maximum, when tested in accordance with ASTM C-136. The maximum mixing temperature shall not exceed 310° at the time of mixing.

402-3.3 TEST SECTION

DELETE: This section and replace with the following:

The contractor shall schedule plant production on the first day of paving in order that a test section can be constructed. The test section shall be approximately 1000 feet in length and at least 12.5 feet in width. If mix production or mix laydown problems occur, the contractor shall make

corrective adjustments and may not continue paving past the limits of the strip until such corrective adjustments are made. Upon approval of the Engineer, the contractor may continue paving past the limits of the test section. All preparation materials and construction methods shall be identical to those to be used on the remainder of the runway surface, and as specified in these Special Provisions and the construction plans. No separate payment will be made for construction of the test section, but will be paid for in accordance with section 402-6.1.

CONSTRUCTION METHODS

402-4.1 WEATHER AND SEASONAL LIMITATIONS

DELETE: This section and replace with the following:

The porous friction course shall be constructed on a dry surface when the atmospheric temperature has been 60°F and rising two days before and is 60°F and rising on the day of placement. In addition, the weather cannot be foggy or rainy and the wind conditions must be less than or equal to 15 mph on the day of paving.

402-4.2 BITUMINOUS MIXING PLANT

INSERT: The following as the first paragraph:

“The bituminous hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I bituminous mixtures in accordance with Section 1102 of the current Standard Specifications for Road and Bridge Construction. In addition, the contractor or producer shall provide a testing laboratory, meeting the requirements of IDOA’s latest Policy Memorandum 96-2 “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures. The lab shall be used for quality control testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.

402-4.3 HAULING EQUIPMENT

DELETE: The last sentence and replace with:

All trucks shall have an insulated bed sufficient to maintain the mixture at the specified temperature during hauling. The tarps shall be used at all times when transporting the PFC.

402-4.4 BITUMINOUS PAVERS

ADD: The following to the fourth paragraph:

The paver speed shall not exceed 35 feet per minute. Only electronic grade control for both the horizontal and transverse control of grade shall be used

on this project. The use of 30 foot long (minimum) paving ski's and matching shoes are required.

402-4.5 ROLLERS

DELETE: This section and replace with the following:

A minimum of two (2) self propelled steel-wheel rollers shall be furnished. They shall be in good condition, capable of reversing without backlash, and of operating at slow speeds to avoid displacement of the bituminous mixture. The wheels shall be equipped with adjustable scrapers, water tanks and a sprinkling apparatus to prevent the bituminous mixture from sticking to the wheels. If approved by the Engineer, the contractor may add a small amount of detergent to the roller's water tanks to alleviate roller pick up. The weight of each roller shall be between 6 and 10 tons. When approved by the Engineer, vibratory rollers may be used in the static mode. The use of equipment, which results in crushing of the aggregate, will not be permitted. The resident engineer in compliance with these Special Provisions must approve all rollers at least one (1) day prior to paving.

402-4.6 PREPARATION OF MINERAL AGGREGATE

ADD: The following to this section:

The use of frozen aggregates or frozen aggregate stockpiles is prohibited. Frozen aggregates or frozen stockpiles must be thawed and/or double dried to reduce the combined aggregate moisture content to at or below 0.5 percent.

402-4.7 PREPARATION OF BITUMINOUS MIXTURE

DELETE: The second sentence of the first paragraph and replace with the following:

The porous friction course shall be prepared at the temperature designated by the Engineer; the mixture shall not exceed 310°F at the time of mixing.

402-4.8 TRANSPORTATION AND DELIVERY OF THE MIXTURE

DELETE: This section and replace with the following:

The mixture shall be transported from the central mixing plant to the paving site in trucks described in 402-4.3. The time interval between mixing and laydown shall not be more than one (1) hour. The open graded bituminous mixture shall be placed at a temperature of 290°F plus or minus 10°F. Delivery of mixture to the spreader shall be scheduled so that spreading and rolling occur in a continuous matter. Intermittent production or stopping and starting of the pavers will be cause for suspension of work.

402-4.9 SPREADING AND LAYING

DELETE: This section and replace with the following:

(a) Preparation of Existing Surfaces

The existing pavement surface will be tacked in accordance with item 603. The Engineer will set the exact rate. The pavement shall be cleared of all loose or deleterious material with brooms or blowers before the tack coat is placed.

(b) Placing

Hauling over material already placed shall not be permitted until the material has been thoroughly compacted as specified and allowed to cool overnight and develop its stability for a period of at least 24 hours. No traffic or hauling will be allowed on the newly laid PFC during extremely hot temperatures or when marking or displacement of the porous friction course is observed.

402-4.10 COMPACTION OF MIXTURE

DELETE: The last two sentences of the first paragraph and replace with the following:

No more than a total of three passes by the rollers will be required. The optimum weight of the rollers and the rolling pattern shall be determined during the test section construction. The number and type of rollers will be as specified in section 402-4.5.

402-4.11 JOINTS

ADD: The following to this section:

Longitudinal joints will be butt joints and no lapping of pavements will be allowed.

402-4.16 PROTECTION OF PAVEMENT

DELETE: This section and replace with the following:

After final rolling, no vehicle traffic of any kind shall be permitted on the pavement until it has cooled and cured at least 24 hours. The contractor may, with the approval of the Resident Engineer, water the pavement in order to cool it.

METHOD OF MEASUREMENT

402-5.1 MEASUREMENT OF BITUMINOUS FRICTION COURSE

DELETE: This section and replace with the following:

Porous friction course shall be measured as the number of square yards of pavement in place and accepted in accordance with these Special

Provisions. Only the areas of porous friction course meeting the following thickness requirements shall be measured for payment:

The compacted thickness of the porous friction course will be measured in place at random locations for each 3,000 square yards of pavement. Minimum acceptable thickness of porous friction course is as shown in the table below. When a random in place measurement is less than the minimum acceptable thickness, additional thickness measurements will be taken at necessary intervals until the porous friction course is within the limits. All areas that are determined to be less than the thickness shown in the table below shall be removed and replaced at the contractor's expense.

PAY ITEM	MINIMUM THICKNESS
Item AR402620 -- Porous Friction Course 5/8"	1/2 inches
Item AR402621 -- Porous Friction Course, 1"	3/4 inches
Item AR402622 -- Porous Friction Course, 0.10'	1 inch

BASIS OF PAYMENT

402-6.1

Payment will be made under:

- Item AR402620 -- Porous Friction Course 5/8" -- per square yard
- Item AR402621 -- Porous Friction Course, 1" -- per square yard
- Item AR402622 -- Porous Friction Course, 0.10' -- per square yard

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 602 BITUMINOUS PRIME COAT

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 602 "Bituminous Prime Coat" is modified as outlined below:

DESCRIPTION

602-1.2 QUANTITIES OF BITUMINOUS MATERIAL

DELETE: This section and replace with the following:

After the base has been prepared, and when in a dry condition, the bituminous material shall be applied uniformly at a rate of 0.25 to 0.5 gal/sq. yd., the exact rate to be specified by the Engineer.

MATERIALS

602-2.1 BITUMINOUS MATERIAL

DELETE: This section and replace with the following:

The bituminous priming material shall be MC-30. Medium curing liquid asphalt will be accepted according to the latest revision of the Bureau of Materials and Physical Research policy memorandum "Cut-Back Asphalt and Road Oil Acceptance Procedure."

CONSTRUCTION METHODS

602-3.1 WEATHER LIMITATIONS

DELETE: This Section and replace with the following:

The prime coat shall be applied only when the existing surface is dry or contains sufficient moisture to get uniform distribution of bituminous material. This work shall be done between May 1 and October 1, both dates inclusive. Bituminous materials shall be applied only when the temperature of the air in the shade is above 60°F. No work shall be started if the local conditions indicate that rain is imminent. This work may be done between October 1 and October 31 providing the temperature of the air for three consecutive days immediately preceding the day of application has been: (1) Above 60

°F in the shade each day, (2) A minimum of 40°F and (3) The temperature of the air in the shade at time of application is above 60°F.

602-3.2 EQUIPMENT

DELETE: This Section and replace with the following:

Pressure Distributor. The pressure distributor used for applying liquid bituminous materials shall be a self-propelled motor vehicle and shall meet the requirements given hereinafter:

Truck. The truck shall be capable of operating smoothly at speeds as low as 0.8 mph when used on heavy penetration construction, and at normal road speeds when used for transporting bituminous materials. In order to develop these speeds satisfactorily, the truck shall have at least 4 speeds forward.

Tank. The tank on the distributor shall have a capacity of not less than 600 gallons. Approval shall be obtained from the Engineer for the use of a distributor having a capacity greater than 2500 gallons. The tank shall be covered with at least 1 inch of approved insulation. It shall be equipped with a removable manhole cover, and overflow pipe and a suitable strainer located at the intake or outlet to the pump to prevent the passage of any material which might clog the nozzles. A dial gauge plainly visible to the spray bar operator shall be conveniently placed to indicate the contents of the tank at various levels.

Heating System. The distributor shall be equipped with an approved heating system to heat the bituminous material. The heating system shall consist of heat flues having sufficient radiation to ensure the rapid circulation of hot gases of combustion from one or more efficient smokeless burners of the torch type, a circulating device to ensure uniform heating of the material, and a suitable fuel supply tank.

Pump. The distributor pump shall be of the rotary positive pressure type of sufficient size and discharge capacity to apply uniformly the specified amount of bituminous material per square yard in widths up to 24 ft. It shall be driven in the most direct method obtainable by a gasoline motor other than the vehicle propelling motor or by other methods approved by the Engineer. The pump motor shall have sufficient power to operate the distributor pump at the required volume and pressure. If the motor pump is equipped with a transmission, it shall have a governor. Suitable housing or heating jackets shall be provided to enclose the distributor pump and piping in order to retain the heat and to ensure a constant, even flow of material.

Spray Bars. Spray bars of various lengths shall be used to spray bituminous material over widths varying from 4 to 24 ft. . The spray bars shall be arranged so that they may be swung from side to side over a distance of not less than 9 inches to match joints and to clear obstructions. They shall be equipped with spray nozzles of such design and size of orifice as to ensure uniform distribution of the bituminous material in the specified quantities.

Means shall be provided to stop the flow of bituminous material quickly and to prevent it from dripping when the flow is shut off.

Means shall be provided for obtaining samples of the materials from the tank or from the piping leading from the tank to the spray bars.

A hand spray bar and nozzle having a suitable length of flexible hose with packed couplings shall be provided for applying material at fillets or similar locations.

Thermometer. A calibrated thermometer having the stem extending into the material or into an approved well shall be placed in a suitable position in the tank to give a true average temperature of the contents of the tank.

Operator's Platform. A substantial platform for the operator shall be provided at the rear of the distributor. It shall be so located that it will provide a clear view of the operation of the spray bars.

Tachometer or Synchronizer. A tachometer shall be attached to the truck in such a manner as to be visible to the truck operator and to enable him/her to maintain the constant speed necessary for the correct application of the specified quantity of bitumen. Suitable charts shall be furnished by the contractor showing the truck speeds necessary to obtain the desired results.

When a synchronizer is used, the tachometer may be omitted. The synchronizer shall deliver a specified quantity of bituminous material on the pavement surface regardless of the speed of the truck.

Calibration. The distributor will be calibrated by the Contractor and verified by the Resident Engineer before the work is started. The Contractor shall furnish all equipment, tools, materials and assistance necessary to verify the calibration.

602-3.3 APPLICATION OF BITUMINOUS MATERIAL

ADD: The following to the first paragraph:

The temperature of the bituminous material at the time of application shall be such that it will spray uniformly without clogging the spraying nozzles and shall be applied within the temperature range of 85°F to 90°F. Bituminous material delivered in the tank cars may be heated by steam coils; that delivered in mobile tanks may be heated in asphalt tanks or in a pressure distributor. In all cases, precautions shall be taken to avoid danger of fire. If heated in asphalt tanks, the material shall be agitated during the heating period to prevent localized overheating. If heated in a pressure distributor, the material shall be circulated while it is being heated. All flames shall be extinguished during application of the bituminous material. In all methods of heating, means shall be provided to determine the temperature of the material at frequent intervals to prevent it from being overheated or damaged.

ADD: The following to the second paragraph:

A hand spray bar shall be used at places which are not covered by the distributor. The entire length of the spray bar shall be set at the height above the surface recommended by the manufacturer for even distribution of the bituminous material. Any loss of bituminous material in handling due to faulty valves, leaking pipes, overflow loss of excess, or other reasons will be deducted from the amount due the contractor. The distributor shall be operated in a manner such that missing or overlapping will be avoided. When required by the Resident Engineer, adjacent construction shall be protected by shields, covers, or other means. If bituminous material is applied to adjacent construction either by accident or because of inadequate protection, the contractor shall remove such material to the satisfaction of the Engineer. If the contractor is unable to obtain satisfactory application due to unsuitable or poorly regulated distributing equipment, or to incompetent operators, the contractor shall immediately replace or repair such equipment or furnish competent operators.

DELETE: The third paragraph and replace with the following:

The prime coat shall be permitted to cure until the penetration has been approved by the Engineer, but at no time shall the curing period be less than 24 hours. Pools of bituminous material occurring in the depressions shall be broomed or squeegeed over the surrounding surface the same day the prime coat is applied. At no time during curing shall traffic be allowed upon the primed surface. The prime coat shall be maintained at all times by the contractor.

602-3.4 BITUMINOUS MATERIAL, CONTRACTOR'S RESPONSIBILITY

ADD: The following as the third paragraph:

The bituminous material shall be supplied from an IDOT certified source indicated on the latest IDOT Certified Source List for Emulsified Asphalt and/or the certified source list for Asphalt Cement, Cutback Asphalt, and Road Oil, as applicable.

BASIS OF PAYMENT

602-5.1

Payment will be made under:

Item AR602510 -- Bituminous Prime Coat -- per gallon.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 603 BITUMINOUS TACK COAT

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 603 "Bituminous Tack Coat" is modified as outlined below:

DESCRIPTION

603-1.2 QUANTITY OF MATERIAL

DELETE: This section and replace with the following:

The approximate amount of diluted (unless cutback asphalt is used) bituminous material per square yard for the tack coat application shall be as shown in Table 1 of this Supplemental Specification. The exact application rate shall be determined in the field and approved by the Resident Engineer based on a visual inspection and existing conditions. The ratio of emulsified asphalt to water shall be as specified in 603-2.1 Bituminous Material.

MATERIALS

603-2.1 BITUMINOUS MATERIAL

DELETE: This section and replace with the following:

The contractor shall use any one of the applicable bituminous materials for the tack coat shown in Table 1 of this Supplemental Specification. The contractor shall dilute the emulsified asphalt at the ratio shown in Table 1 of this Supplemental Specification. HFE-90 shall be diluted by the manufacturer. No additional diluting at the jobsite is allowed for HFE-90. The diluted material shall be thoroughly agitated within 24 hours of application and show no separation of water and emulsion. The diluted material shall not be returned to an approved emulsion storage tank.

CONSTRUCTION METHODS

603-3.1 WEATHER LIMITATIONS

ADD: Weather Limitations shall be as shown in Table 1 of this Supplemental Specification.

603-3.2 EQUIPMENT

DELETE: This Section and replace with the following:

Pressure Distributor. The pressure distributor used for applying liquid bituminous materials shall be a self-propelled motor vehicle and shall meet the requirements given hereinafter:

Truck. The truck shall be capable of operating smoothly at speeds as low as 0.8 mph when used on heavy penetration construction, and at normal road speeds when used for transporting bituminous materials. In order to develop these speeds satisfactorily, the truck shall have at least 4 speeds forward.

Tank. The tank on the distributor shall have a capacity of not less than 600 gallons. Approval shall be obtained from the Engineer for the use of a distributor having a capacity greater than 2500 gallons. The tank shall be covered with at least 1 inch of approved insulation. It shall be equipped with a removable manhole cover, and overflow pipe and a suitable strainer located at the intake or outlet to the pump to prevent the passage of any material which might clog the nozzles. A dial gauge plainly visible to the spray bar operator shall be conveniently placed to indicate the contents of the tank at various levels.

Heating System. The distributor shall be equipped with an approved heating system to heat the bituminous material. The heating system shall consist of heat flues having sufficient radiation to ensure the rapid circulation of hot gases of combustion from one or more efficient smokeless burners of the torch type, a circulating device to ensure uniform heating of the material, and a suitable fuel supply tank.

Pump. The distributor pump shall be of the rotary positive pressure type of sufficient size and discharge capacity to apply uniformly the specified amount of bituminous material per square yard in widths up to 24 ft. It shall be driven in the most direct method obtainable by a gasoline motor other than the vehicle propelling motor or by other methods approved by the Engineer. The pump motor shall have sufficient power to operate the distributor pump at the required volume and pressure. If the motor pump is equipped with a transmission, it shall have a governor. Suitable housing or heating jackets shall be provided to enclose the distributor pump and piping in order to retain the heat and to ensure a constant, even flow of material.

Spray Bars. Spray bars of various lengths shall be used to spray bituminous material over widths varying from 4 to 24 ft. . The spray bars shall be arranged so that they may be swung from side to side over a distance of not less than 9 inches to match joints and to clear obstructions. They shall be equipped with spray nozzles of such design and size of orifice as to ensure uniform distribution of the bituminous material in the specified quantities. Means shall be provided to stop the flow of bituminous material quickly and to prevent it from dripping when the flow is shut off.

Means shall be provided for obtaining samples of the materials from the tank or from the piping leading from the tank to the spray bars.

A hand spray bar and nozzle having a suitable length of flexible hose with packed couplings shall be provided for applying material at fillets or similar locations.

Thermometer. A calibrated thermometer having the stem extending into the material or into the material or into an approved well shall be placed in a suitable position in the tank to give a true average temperature of the contents of the tank.

Operator's Platform. A substantial platform for the operator shall be provided at the rear of the distributor. It shall be so located that it will provide a clear view of the operation of the spray bars.

Tachometer or Synchronizer. A tachometer shall be attached to the truck in such a manner as to be visible to the truck operator and to enable him/her to maintain the constant speed necessary for the correct application of the specified quantity of bitumen. Suitable charts shall be furnished by the contractor showing the truck speeds necessary to obtain the desired results.

When a synchronizer is used, the tachometer may be omitted. The synchronizer shall deliver a specified quantity of bituminous material on the pavement surface regardless of the speed of the truck.

Calibration. The distributor will be calibrated by the Contractor and verified by the Resident Engineer before the work is started. The Contractor shall furnish all equipment, tools, materials and assistance necessary to verify the calibration.

603-3.3 APPLICATION OF BITUMINOUS MATERIAL

ADD: The following to the second paragraph:

The bituminous material for the tack coat shall be applied in such a manner as to yield the coverages shown in Table 1 of this Supplemental Specification.

Delete the second sentence of the third paragraph and replace with the following:

The cure period for the bituminous tack coat shall be as shown in Table 1 of this Supplemental Specification.

603-3.4 BITUMINOUS MATERIAL, CONTRACTOR'S RESPONSIBILITY

ADD: The following as the third paragraph:

The bituminous material shall be supplied from an IDOT certified source indicated on the latest IDOT Certified Source List for Emulsified Asphalt

and/or the certified source list for Asphalt Cement, Cutback Asphalt, and Road Oil, as applicable.

METHOD OF MEASUREMENT

603-4.1 ADD: The Bituminous Tack Coat to be paid for shall be the number of gallons of undiluted material used and accepted.

BASIS OF PAYMENT

603-5.1

Payment will be made under:

Item AR603510 -- Bituminous Tack Coat -- per gallon.

TABLE 1

Proposed layer	Existing base to be tacked	Allowable tack material	Dilution rate	Application rate of diluted tack coat	Visual inspection guide	Cure time	Weather limitations
(201/401) Bituminous base/surface course	(201/401) Bituminous base/surface course	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90, RC-70	Equal volume of water for all emulsions (50% emulsion/ 50% water). Does not apply for cutback asphalt	.05-.15 gal/s.y. for emulsions. .03-.08 gal/s.y. for cutback asphalt. To be determined by the Engineer based on visual inspection.	Uniform coverage of a light coating between layers and on the heavier side for existing surfaces. Avoid streaking. Areas worn from hauling operations shall be re-tacked.	When the tack coat dries (“breaks”) to the satisfaction of the Resident Engineer.	In accordance with 603-3.1 Weather Limitations .
(201/401) Bituminous base/surface course	Grooved bituminous surface course (401)	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90	80% Emulsion/ 20% Water	0.1 – 0.2 gal/s.y. to be determined by the Engineer based on visual inspection.	At least 2/3 of the groove depth has been filled with residual asphalt and a light film exists on the top of the groove. May require multiple applications.	Minimum 24 hours. The tack coat must be dry (cured) to the satisfaction of the R.E.	In accordance with 603-3.1 Weather Limitations .
(201/401) Bituminous base/surface course	Porous Friction Course (402)	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90	80% Emulsion/ 20% Water	0.1 – 0.25 gal/s.y. to be determined by the Engineer based on visual inspection.	Uniform coverage of a light coating between layers and on the heavier side for existing surfaces. Avoid streaking. Areas worn from hauling operations shall be re-tacked.	Minimum 24 hours. The tack coat must be dry (cured) to the satisfaction of the R.E.	In accordance with 603-3.1 Weather Limitations .
Porous Friction Course (402)	Porous Friction Course (402)	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90	90% Emulsion/ 10% Water	0.15 – 0.30 gal/s.y. to be determined by the Engineer based on visual inspection.	Uniform coverage of tack with a thickness of .06 inches (about the thickness of a penny) on the aggregate particles. The surface voids should be filled and the surface should show some texture from the tips of the larger size stone showing through the tack material.	Minimum 24 hours. The tack coat must be dry (cured) to the satisfaction of the R.E.	In accordance with 603-3.1 Weather Limitations , except raise temperature to 60°F and rising.

TABLE 1

Proposed layer	Existing base to be tacked	Allowable tack material	Dilution rate	Application rate of diluted tack coat	Visual inspection guide	Cure time	Weather limitations
Porous Friction Course (402)	Grooved bituminous surface course (401)	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90	90% Emulsion/ 10% Water	0.15 – 0.30 gal/s.y. to be determined by the Engineer based on visual inspection.	At least 2/3 of the groove depth has been filled with residual asphalt and a residual asphalt of .06 inches (about the thickness of a penny) on the top of the grooves. May require multiple applications.	Minimum 24 hours. The tack coat must be dry (cured) to the satisfaction of the R.E.	In accordance with <u>603-3.1 Weather Limitations</u> , except raise temperature to 60°F and rising.
Porous Friction Course (402)	(201/401) Bituminous base/surface course	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90	80% Emulsion/ 20% Water	0.1 – 0.25 gal/s.y. to be determined by the Engineer based on visual inspection.	Uniform coverage .06 inches thick (about the thickness of a penny). May require two (2) applications. Avoid streaking. Areas worn from hauling operations shall be re-tacked.	Minimum 24 hours. The tack coat must be dry (cured) to the satisfaction of the R.E.	In accordance with <u>603-3.1 Weather Limitations</u> , except raise temperature to 60°F and rising.
(201/401) Bituminous base/surface course	(501) P.C. Concrete	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90, RC-70	Equal volume of water for all emulsions (50% emulsion/ 50% water). Does not apply for cutback asphalt	.05-.15 gal/s.y. for emulsions. .03-.08 gal/s.y. for cutback asphalt. To be determined by the Engineer based on visual inspection.	Uniform coverage of a light coating on the heavier side for existing surfaces. Avoid streaking. Areas worn from hauling operations shall be re-tacked.	When the tack coat dries (“breaks”) to the satisfaction of the Resident Engineer.	In accordance with <u>603-3.1 Weather Limitations</u> .
(201/401) Bituminous base/surface course	(501) P.C. Concrete, grooved	SS-1, SS-1h, CSS-1, CSS-1h, HFE 90	80% Emulsion/ 20% Water	0.15 – 0.30 gal/s.y. to be determined by the Engineer based on visual inspection.	At least 2/3 of the groove depth has been filled with residual asphalt and a light fog on the top of the grooves.	Minimum 24 hours. The tack coat must be dry (cured) to the satisfaction of the R.E.	In accordance with <u>603-3.1 Weather Limitations</u> , except raise temperature to 60°F and rising.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 605 JOINT SEALING FILLER

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 605 "Joint Sealing Filler" is modified as outlined below:

DESCRIPTION

605-1.1 ADD: Fillers shall be capable of effectively sealing contraction joints, construction joints and expansion joints.

MATERIALS

605-2.1 JOINT SEALING MATERIALS

DELETE: Options (a), (b), and (d).

ADD: The joint sealing materials shall be as shown in the plans.

Mixing of components, temperature and application shall be as recommended by the manufacturer.

Joint dimensions shall conform to the details in the plans.

ADD:

605-2.2 BACKER ROD MATERIAL

The rod shall be a heat resistant cross linked closed cell polyethylene or polyurethane. The backer rod shall be compatible with the sealant and no bond or reaction shall occur between the rod and sealant. The rod shall be installed in the joint to the depths and diameters as indicated in the plans.

CONSTRUCTION METHODS

605-3.1 TIME OF APPLICATION

ADD: If the pavement must be opened to traffic prior to placement of the sealant, the joints are to be temporarily filled with a jute or nylon rope immediately after the joint is sawed. The rope should be slightly larger than

the joint and should be forced into the joint so that the top of the rope is 1/8" below the pavement surface. The rope shall be removed immediately prior to cleaning. No additional compensation for temporary sealing will be allowed.

If rain precedes joint sealing after installation of the backer rod, the rod shall be replaced prior to installation of the sealant.

Joint sealing shall not start until after the pavement has been grooved if grooving is required.

605-3.2 EQUIPMENT

ADD: After the First Paragraph.

The installation equipment for the preformed elastomeric joint material shall be a self-propelled automatic joint sealed installation machine manufactured for the purpose of installing preformed joint sealants. Installation of preformed joint sealants without this machine will not be allowed.

DELETE: Sixth Paragraph.

ADD: The equipment for cleaning joint openings shall consist of such air compressors, and blasters and, if necessary, joint cleaning and grooving machines as are necessary to produce a satisfactory clean and dry joint. Similar equipment shall be provided for cleaning joints previously sealed.

Air compressors used for this purpose must be equipped with traps capable of removing moisture and oil from the air.

605-3.3 PREPARATION OF JOINTS

ADD: All joints shall be sawed to the dimensions and at the locations shown on the plans unless noted otherwise.

All sawed joints shall be sandblasted or waterblasted and all laitance or sand blown out of the joint prior to sealing with oil free compressed air at a pressure of at least 90 psi.

For liquid sealants, the backer rod when specified, shall be placed in the bottom of the joint prior to sealing. For expansion joints the separating medium shall be an approved nonreactive adhesive-backed tape adhered to the top surface of the remaining portion of the insert. The tape shall be 1/8-inch wider than the nominal width of the joint.

605-3.4 PLACING JOINT SEALANT

ADD: The joint sealant shall be applied in a continuous operation to properly fill and seal the joint to the dimension shown in the plans. The sealant shall be applied such that it is slightly concave approximately 1/8" to 1/4" below the pavement surface.

Traffic shall be restricted from the pavement for three hours.

605-3.6 JOINT SAWING

Joint sawing shall conform to the applicable provisions of Item 501-3.12 Portland Cement Concrete Pavement. Sawed joint dimensions shall be as shown in the plans.

METHOD OF MEASUREMENT

605-4.1 DELETE: Entire Paragraph.

ADD: The joint sawing and sealing for the proposed PCC pavement shall be incidental to Item 501. No separate measurement for payment will be made for this item.

BASIS OF PAYMENT

605-5.1 DELETE: Entire Paragraph.

ADD: Payment for joint sealing in the new PCC Pavement shall be incidental to Item 501.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 609 SEAL COATS AND BITUMINOUS SURFACE TREATMENTS

RESERVED

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 610 STRUCTURAL PORTLAND CEMENT CONCRETE

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 610 "Structural Portland Cement Concrete" is modified as outlined below:

DESCRIPTION

610-1.1 ADD: This item shall include all formwork, furnishing and placing of reinforcement and concrete used in the construction of all fencing, drainage, lighting installation and other miscellaneous concrete construction.

MATERIALS

610-2.2 COARSE AGGREGATE

DELETE: Second Paragraph.

ADD: The coarse aggregate shall meet the IDOT 022CA07 or 022CA11 Gradation.

The coarse aggregate shall be a crushed stone.

610-2.4 CEMENT

ADD: The cement used shall be portland cement type (I) conforming to the requirements of ASTM C 150.

610-2.6 ADMIXTURES

ADD: All concrete shall be air-entrained by the use of an admixture. Admixtures shall be approved by the Engineer prior to their use.

610-2.7 PREMOLDED JOINT MATERIAL

ADD: Premolded joint material shall meet the requirements for ASTM D 1751.

610-2.9 STEEL REINFORCEMENT

DELETE: This Section.

ADD: Reinforcement bars shall conform to the requirements of ASTM A615, Grade 60 deformed bars. Welded wire fabric shall conform to the requirements of AASHTO M55, ASTM A 82, or ASTM A 185, plain type, flat stock only.

CONSTRUCTION METHODS

610-3.2 CONCRETE PROPORTIONS

ADD: Concrete provided under this item shall be IDOT approved Class SI concrete, air entrained with crushed stone coarse aggregate.

The Contractor shall be responsible for obtaining the job mix design meeting the requirements of this item. The Contractor shall refer to the Illinois Division of Aeronautics Policy Memorandum 96-1, dated January 10, 2003 for the Job Mix Formula Approval and Production Testing.

The Contractor shall provide actual batch weight tickets for every batch of Item 610 concrete used on the project to be collected by the Resident Engineer upon delivery of each batch of concrete. The actual batch weight tickets shall be kept with the project records by the Resident Engineer and shall be available upon request of the Department of transportation.

Concrete provided under this item shall be a workable plastic concrete having a compressive strength of not less than 3,500 pounds per square inch at the age of 14 days when tested in accordance with ASTM C39.

The concrete shall have a maximum slump of three inches (3") when tested in accordance with ASTM C-143.

610-3.8 FORMS

DELETE: First and second paragraphs.

ADD: The design and engineering of formwork, as well as its construction shall be the responsibility of the Contractor. Forms shall be of wood, metal, or other material approved by the Engineer and shall be designed, fabricated, braced, and maintained such that the finished concrete conforms to the true lines and dimensions specified in the plans. Forms shall be tight and of sufficient rigidity to prevent distortion due to the pressure of the concrete and other construction loadings, including vibration.

The maximum deflection of facing materials reflected in concrete surfaces exposed to view shall not be greater than 1/240 of the span between structural members. 3/4" chamfer strips shall be placed in the corners of the column, beam, and wall forms where the concrete will be exposed to view.

Where necessary to maintain the specified tolerances, the formwork shall be cambered to compensate for anticipated deflections in the formwork due to the weight and pressure of the fresh concrete and due to construction loads.

Temporary openings shall be provided at the base of wall forms and at other points where necessary to facilitate cleaning and inspection immediately before concrete is deposited.

Form accessories to be partially or wholly embedded in the concrete, such as ties and hangars, shall be a commercially manufactured type. The portion remaining within the concrete shall leave no metal within one inch of the surface when the concrete is exposed to view. Spreader cones on ties shall not exceed one inch in diameter.

Plywood or other wood surfaces shall be sealed against absorption of moisture from the concrete by either (1) a field applied, approved, form oil or sealer, or (2) a factory applied non-absorptive liner.

When forms are coated to prevent bond with concrete, it shall be done PRIOR to placing of the reinforcing steel. Excess coating material shall not be allowed to stand in puddles in the forms nor allowed to come in contact with concrete against which fresh concrete will be placed.

Forms shall be wetted with water or with a nonstaining mineral oil which shall be applied shortly before the concrete is placed.

If forms are to be reused, the Contractor shall maintain the shape, strength, rigidity and surface smoothness of all reused sections. Any formwork which is warped or contains bulges shall be repaired or discarded. All reused formwork shall be subject to approval of the Engineer.

Formwork for walls, sides of beams, and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations, particularly when form ties will be bent by the removal operations.

Formwork for beam soffits and slabs and other parts that support the weight of concrete, shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise specified or permitted.

610-3.11 PLACING CONCRETE

ADD: Concrete shall be placed in conformance with ACI 318 and ACI 304. The method and manner of placing concrete shall be such as to avoid segregation or separation of the aggregates or the displacement of reinforcing steel.

Chutes shall extend as nearly as practicable to the point of deposit. For wall placement in excess of six feet vertical height, a tremie shall be used in placing the concrete. If reinforcing steel or formwork is such that a tremie cannot be used, the method of placement shall be approved by the Engineer.

Placement of concrete shall be regulated so that the pressures caused by the wet concrete will not exceed those used in the design of the forms. Concrete

placed in vertical forms shall be placed in lifts of not more than two feet which shall be kept practically level.

610-3.16 CURING AND PROTECTION

DELETE: This Section.

ADD: Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures, and shall be maintained with a minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete.

Initial curing shall immediately follow the finishing operation, and shall continue for a minimum of 24 hours after placement. Concrete shall be kept continuously moist by one of the following methods listed below:

- (1) Polyethylene Sheeting. The unformed surfaces shall be covered with polyethylene sheeting as soon as the concrete has hardened sufficiently to prevent marring the surface. The surface of the concrete shall be wetted immediately before sheeting is placed. Use of a layer of wetted burlap beneath the sheeting may be required at the option of the Engineer. The edges of the sheeting shall have sufficient lap and shall be fastened securely by any means satisfactory to the Engineer to provide an airtight cover. Tears or holes in the sheeting will not be permitted.
- (2) Membrane Curing. After the concrete has been finished and immediately after the water sheen is no longer visible on the surface of the concrete, the surface shall be cured with membrane curing compound. Curing compound may be "Kurez" by the Euclid Chemical Company, "Horncure" by W.R. Grace, "Masterkure" by Master Builders, or equal. Curing compounds may be used to cover all exposed surfaces. Membrane curing will not be permitted at construction joints or on vertical wall surfaces. Application shall be such to completely cover all exposed surfaces and rate of coverage shall be in accordance with the manufacturers' recommendations.

The above curing compounds shall be used unless other special floor treatments are required by the Special Provisions.

- (3) Continuous Wetting. After the concrete has been finished and is hardened sufficiently to prevent any type of surface damage, curing shall be accomplished by continuous steam not exceeding 150°F, a continuous vapor mist bath or by the use of a burlap fabric kept continuously saturated. Mechanical equipment used in this method shall be modern and maintained in good working condition throughout the specified curing period. All equipment and procedures shall meet the approval of the Engineer prior to its use.

Immediately following the initial curing and before the concrete has dried, additional curing shall be accomplished by one of the following methods:

- (1) Continuing the method used in initial curing.
- (2) Waterproof Paper. While the concrete surface is still wet, the surface shall be covered with waterproof paper meeting the approval of the Engineer. The paper shall be lapped a minimum of 12 inches end to end and such laps and ends shall be securely held in place to form a closed joint. Tears or holes in the paper will not be permitted.
- (3) Other moisture-retaining coverages which are practical and meet the approval of the Engineer.

The final curing shall continue until the cumulative number of days of initial and final curing totals not less than seven (7) days. Rapid drying at the end of the curing period shall be prevented.

Steel forms heated by the sun and all wood forms in contact with the concrete during the final curing period shall be kept wet. If forms are to be removed during the curing period, one of the above curing methods shall be employed immediately. Such curing shall be continued for the remainder of the curing period.

METHOD OF MEASUREMENT

610-4.1, 610-4.2, 610-4.3

DELETE: These Sections.

BASIS OF PAYMENT

610-5.1 DELETE: Entire Section.

ADD: No direct payment will be made for structural portland cement concrete. The cost of furnishing and installing structural concrete shall be considered incidental to the contract unit prices for the respective pay items utilizing the concrete. These prices shall be full compensation for furnishing all materials and for all preparation, delivering and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete the item.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 620 PAVEMENT MARKING

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 620 "Pavement Marking" is modified as outlined below:

MATERIALS

DELETE: Article 620-2.1 Paint and 620-2.2 Reflective Media and replace with the following:

620-2.1 MATERIAL ACCEPTANCE

Paint and reflective glass beads shall be pre-approved by the Illinois Department of Transportation. The contractor shall provide to the Resident Engineer an LA-15 with Test ID number(Supplier's Certification of Shipment of Approved Materials) or a manufacturer's certification listing the IDOT approval number for each batch/lot of paint and beads. Certification or LA-15's shall be submitted to the Resident Engineer upon delivery of materials (or prior to delivery of materials) to the jobsite. The manufacturer's certification shall include a statement that the material meets the specification requirements. It shall also include a batch or lot number that correlates with a batch or lot number on the material container. The Division of Aeronautics, however, reserves the right to perform verification testing for acceptance of these materials.

620-2.2 PAINT

Paint shall be one of the following types, as specified:

1. WATERBORNE. The waterborne paint shall meet the following requirements:

NOTE TO THE CONTRACTOR: The requirements for yellow and white paint are the same as the requirements in Article 1095.02 of the Illinois Department of Transportation's *Standard Specifications for Road and Bridge Construction, Adopted January 1, 2002*.

Paint shall be formulated and manufactured from first-grade materials. It shall be free from defects and imperfections that might adversely affect

the serviceability of the finished product. It shall be completely free from dirt and other foreign material and shall dry within the time specified to a good, tough, serviceable film. The paint shall show no evidence of excessive settling, gelling, skinning, spoilage or livering upon storage in the sealed shipping containers under normal above freezing temperatures within twelve (12) months of deliver. Any settled portion shall be easily brought back into suspension by hand mixing. When the settled portion is brought back into suspension in the vehicle, the paint shall be homogenous and shall not show a viscosity change of more than 5 KU from the original viscosity. Any paint that has settled within the period of 12 months after delivery to the degree that the settled portion cannot be easily brought into suspension by hand mixing shall be disposed of by the vendor and immediately replaced with acceptable material entirely at the vendor's expense, including handling and transportation charges. The paint, when applied by spraying methods to a bituminous pavement, shall not be discolored due to the solvent action of the paint on the bituminous surface.

All materials shall meet the following paint specifications:

- (a) Ingredients. The ingredients used to manufacture the paint shall meet the following requirements:

TITANIUM DIOXIDE. This material shall comply with the latest revisions of the Specifications for Titanium Dioxide Pigments, ASTM D 476, Type II, Rutile. A notarized certificate of compliance from the pigment manufacturer shall be required.

YELLOW PIGMENT. This material shall be non-toxic organic pigment, Yellow 65: Engelhard 1244 or equivalent

CALCIUM CARBONATE. This material shall comply with the latest revision of the specifications for Calcium Carbonate Pigments, ASTM D1199, Type GC, Grade 1, with minimum of 95% Calcium Carbonate or Type PC, minimum 98% Calcium Carbonate.

ACRYLIC EMULSION POLYMER. This material shall be Rohm and Haas E-2706 or Dow Chemical DT-211.

METHYL ALCOHOL. This material shall comply with the latest revision of the Specification for Methyl Alcohol, ASTM D 1152.

CARBON BLACK. This material shall be a carbon black pigment, either powdered or pre-dispersed form.

MISCELLANEOUS MATERIALS.

Water: Potable

Dispersant: Tamol 850 (Rohm and Haas) or equivalent

Surfactant: Triton CF-10 (Union Carbide) or equivalent

Defoamer: Colloids 654 (Rhone-Poulenc) or equivalent

Rheology Modifier: Natrasol 250 HBR (Aqualon Company) or equivalent

Coalescent: Texanol (Eastman Chemical)

Preservative: Troy 192 (Troy Chemical) or equivalent

- (b) Manufacture. All ingredient materials shall be delivered in the original containers and shall be used without adulteration. The containers shall be marked with the type of material, name of manufacturer and lot number. The manufacturers shall furnish to the Division of Aeronautics the batch formula which will be used in manufacturing the paint. No change shall be made in this formula without prior approval by the Division of Aeronautics and no change will be approved that adversely affects the quality or serviceability of the paint. The following Standard Formulas shall be the basis for the paint. The finished products shall conform on a weight basis to the composition requirements of these formulas. No variations will be permitted except for the replacement of volatile lost in processing. Amounts are shown in kilograms (pounds) of material.

	WHITE	YELLOW	BLACK
Carbon Black	--	--	9.53 (21)**
C.I. Pigment Yellow 65	--	14.52 (32)	--
Titanium Dioxide, Rutile, Type II	45.36 (100)	9.53 (21)	--
Calcium Carbonate, Type PC	68.04 (150)	68.04 (150)	362.87 (800)***
Calcium Carbonate, Type GC	195.05 (430)	210.92 (465)	***
Rheology Modifier	0.23 (0.5)	0.23 (0.5)	.23 (0.5)*
Acrylic Emulsion, 50% Solids	245.40 (541)	242.68 (535)	196.77 (434)
Coalescent	10.89 (24)	10.43 (23)	9.53(21)
Defoamer	2.27 (5)	2.27 (5)	2.27(5)
Dispersant	3.63 (8)	4.08 (9)	3.18 (7)
Surfactant	0.91 (2)	0.91 (2)	1.13 (2.5)
Methyl Alcohol	13.15 (29)	12.70 (28)	13.61 (30)
Preservative	0.68 (1.5)	0.68 (1.5)	0.68 (1.5)
Aqua Ammonia	--	--	0.23 (0.5)
Water	<u>4.54 (10)</u>	<u>4.54 (10)</u>	<u>26.79 (59)**</u>
<i>Total Kilograms (Pounds)</i>	<i>590.15 (1301)</i>	<i>581.53 (1282)</i>	<i>626.82 (1382)</i>

* Rheology Modifier may be varied by up to 0.05 kg (0.1 pound) to adjust viscosity to desired range.

** Carbon black and water content may vary depending upon the pigment form used. Both must be adjusted to meet the paint properties specified herein.

*** The amount shown is total calcium carbonate, Type PC and Type GC.

- (c) Properties. The finished paint shall meet the following requirements.

PIGMENT. Analysis of the extracted pigment shall conform to the following requirements:

	WHITE	YELLOW	BLACK
Carbon Black (%)	--	--	Min. 1.5
Organic Yellow 65 (%)	--	Min. 4.8	--
Titanium Dioxide (%)	Min. 13.4	Min. 2.8	--
Calcium Carbonate (%)	Max. 86	Max. 93	Min. 58

The percent pigment by weight of the furnished product shall not be less than 50% nor more than 54% for white and yellow paint and not less than 59% for black paint.

VEHICLE. The non-volatile portion of the vehicle shall be composed of a 100% acrylic polymer and shall not be less than 44% by weight for white and yellow paint and not less than 38% by weight for black paint.

ORGANIC VOLATILES. The finished paint shall contain less than 150 grams of volatile organic matter per liter of total paint. (ASTM D3960)

TOTAL SOLIDS. The finished paint shall not be less than 73% total non-volatile by weight. (ASTM D2369) for white and yellow paint and not less than 75% for black paint.

UNIT WEIGHT. The unit weight at 25°C (77°F.) of the production batches shall not vary more than plus or minus 0.024 kg/L (0.2 lbs. per gal.) from the weight of the qualification samples.

VISCOSITY. The consistency of the paint shall not be less than 83 nor more than 98 Krebs Units at 25°C (77°F.) for white and yellow paint and not less than 78 nor more than 88 Krebs Units at 25°C (77°F.).

DRY OPACITY. The minimum contrast ratio shall be 0.97 when tested in accordance with Federal Specification, Method 141 a, No. 4121, Procedure B when applied at a wet film thickness of 0.38 mm (15 mils.).

COLOR AND DIRECTIONAL REFLECTANCE (white and yellow paint). The paint, applied at a wet film thickness of 0.38 mm (15 mils) and allowed to dry 24 hours, shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45° circumferential/0° geometry, illuminant C, and 2° observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

White Daylight Reflectance (Y) 85 percent minimum.

*Yellow Daylight Reflectance (Y) 50 percent minimum.

*Shall match Federal 595 Color No. 33538 and chromaticity limit as follows:

X 0.490 0.475 0.485 0.530

Y 0.470 0.438 0.425 0.456

WATER RESISTANCE. The paint shall conform to Federal Specification TT-P-1952D, Section 3.2.5.

FREEZE-THAW STABILITY. The paint shall show no coagulation or change in consistency greater than 10 Krieb Units, when tested in accordance with Federal Specification TT-P-1952D, Section 4.3.8.

ACCELERATED PACKAGE STABILITY. The paint shall show no coagulation, discoloration, or change in consistency greater than 10 Krieb Units when tested in accordance with Federal Specification TT-P-1952D, Section 4.3.4.

DILUTION TEST. The paint shall be capable of dilution with water at all levels with out curdling or precipitation such that the wet paint can be readily cleaned up with water only.

STORAGE STABILITY. After 30 days storage in a three-quarters filled, closed container, the paint shall show no caking that cannot be readily re-mixed to a smooth, homogenous state, no skinning, livering, curdling or hard settling. The viscosity shall not change more than 5 Krieb Units from the viscosity of the original sample.

NO PICK-UP TIME. The no pick-up time shall be less than 10 minutes. The test shall follow the requirements of ASTM D 711 with a wet film thickness of 0.38 mm (15 mils).

GRIND. The paint shall have a grind of not less than 3 on a Hegman Grind Gauge.

FLEXIBILITY. The paint shall show no cracking or flaking when tested in accordance with Federal Specification TT-P-1952D, Section 4.3.5.

DRY THROUGH TIME. The paint, when applied to a non-absorbent substrate at a wet film thickness of 0.38 mm (15 mils) and placed in a humidity chamber controlled at $90 \pm 5\%$ R.H. and a $22.5 \pm 1.4^{\circ}\text{C}$ ($72.5 + 2.5^{\circ}\text{F.}$) shall have a "dry through time" not greater than 15 minutes of the IDOT standard formula. The dry through time shall be determined according to ASTM D 1640, except the pressure exerted shall be the minimum needed to maintain contact with the thumb and film.

NO TRACKING TIME FIELD TEST. The paint shall dry to a no-tracking condition under traffic in three minutes maximum when applied at 0.38 ± 0.03 mm (15 ± 1 mil) wet thickness at 54.4 - 65.6 °C (130 - 150 °F.), and from three to ten minutes when applied at ambient temperatures with 0.72 kg (6 pounds) of glass beads per liter (gallon) of paint for white and yellow paint and without beads for black paint. "No tracking" shall be the time in minutes required for the line to withstand the running of a standard automobile over the line at a speed of approximately 65 km/hr (40 mph), simulating a passing procedure without tracking of the reflectorized line when viewed from a distance of 15 m (50 feet).

2. EPOXY. The epoxy paint shall meet the following requirements:

NOTE TO THE CONTRACTOR: These requirements are the same as the requirements of Article 1095.04 of the Illinois Department of Transportation's *Standard Specifications for Road and Bridge Construction, Adopted January 1, 2002.*

- (a) The epoxy marking material shall consist of a 100 percent solid two-part system formulated and designed to provide a simple volumetric mixing ratio of two components (must be two volumes of Part A and one volume of Part B). No volatile or polluting solvents or fillers will be allowed.
- (b) The Epoxide Value (WPE) of Component A shall be 200-300 when tested according to ASTM D-1652 on a pigment free basis.
- (c) The Total Amine Value of Component B shall be 325-475 when tested according to ASTM D-2074.
- (d) Composition by Weight of Component A:

PIGMENT*	WHITE	YELLOW
Titanium Dioxide ASTM D-476 Type II	21-24%	--
Chrome Yellow ASTM D-211 Type III	--	23-26%
Epoxy Resin	76-79%	74-77%

*No extender pigments are permitted.

- (e) Upon heating to application temperature, the material shall not exclude fumes which are toxic or injurious to persons or property.
- (f) The daylight directional reflectance of the cured epoxy (without glass spheres) shall not be less than 80% (white) and 50% (yellow) relative to magnesium oxide when tested using a color spectrophotometer with a 45 degree circumferential/zero degrees geometry, illuminant C, and two degree observer angle. The color instrument shall

measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm. In addition, the color of the yellow epoxy shall visually match Color Number 33538 of Federal Standard 595a to the satisfaction of the Division of Aeronautics.

- (g) The epoxy pavement marking material, when mixed in the proper ratio and applied at 0.35 mm to 0.41 mm (14 to 16 mils) wet film thickness and with the proper saturation of glass spheres, shall exhibit no tracking time of twenty minutes or more when tested according to ASTM D-711.
- (h) The catalyzed epoxy pavement marking materials when applied to a 100mm x 100mm x 50mm (4 inch by 4 inch by 2 inch) concrete block, shall have a degree of adhesion which results in a 100 percent concrete failure in the performance of this test.

The concrete block shall be brushed on one side and have a minimum strength of 24,100 kPa (3500 psi). A 50 mm (2 inch) square film of the mixed epoxy shall be applied to the brushed surface and allowed to cure for 72 hours at room temperature. A 50 mm (2 inch) square cube is then affixed to the surface of the epoxy by means of an epoxy glue. After the glue has cured for 24 hours, the epoxy specimen is placed on a dynamic testing machine in such a fashion so that the specimen block is in a fixed position and the 50 mm (2 inch) cube (glued to the epoxy surface) is attached to the dynamometer head. Slowly apply direct upward pressure until the epoxy system fails. Record the location of the break and the amount of concrete failure.

- (i) The epoxy pavement marking materials when tested according to ASTM D2240, shall have a shore D hardness of between 75 and 100. Films shall be cast on a rigid substrate at 0.35 mm to 0.41 mm (14 to 16 mils) in thickness and allowed to cure at room temperature for 72 hours before testing.
- (j) The abrasion resistance shall be evaluated on a Taber Abrader with a 1,000 gram load and CS 17 wheels. The duration of test shall be 1,000 cycles. The loss shall be calculated by difference and be less than 82 mgs. The tests shall be run on cured samples of material which have been applied at a film thickness of 0.35 mm to 0.41 mm (14 to 16 mils) to code S-16 stainless steel plates. The films shall be allowed to cure at room temperature for at least 72 hours before testing.
- (k) When tested according to ASTM D638, the epoxy pavement marking materials shall have a tensile strength of not less than 41,300 kPa (6,000 psi). The Type IV specimens shall be cast in a suitable mold not more than 6.3 mm (1/4 inch) thick and pulled at a rate of 6.3 mm (1/4 inch) per minute by a suitable dynamic testing machine. The

samples shall be allowed to cure at room temperature for at least 72 hours before testing.

- (l) When tested according to ASTM 695, the catalyzed epoxy pavement marking materials shall have a compressive strength of not less than 83,000 kPa (12,000 psi). The cast sample shall be conditioned at room temperature for a minimum of 72 hours before performing the indicated tests. The rate of compression of these samples shall be 6.3 mm (1/4 inch) per minute or less.
- (m) The epoxy paint shall be applied to an aluminum alloy panel (Federal Test Std. No. 141, Method 2013) at a film thickness of 0.35 mm to 0.41 mm (14 to 16 mils) and allowed to cure for 72 hours at room temperature. Subject the coated panel for 75 hours to accelerated weathering using the light and water exposure apparatus (fluorescent UV - condensation type) as specified in ASTM G53.

The cycle shall consist of 4 hours UV exposure at 50°C (60°F), followed by 4 hours of condensation at 40°C (54°F). At the end of the exposure period, the panel shall show no substantial change in color or gloss.

- (n) The material shall be shipped to the job-site in substantial containers and shall be plainly marked with the manufacturer's name and address, the name and color of the material, date of manufacture, and batch number.
- (o) Prior to approval and use of the epoxy pavement marking materials, the manufacturer shall submit a notarized certification of an independent laboratory, together with the results of all tests, stating these materials meet the requirements as set forth herein. The certified test report shall state the lot tested, manufacturer's name, brand name of epoxy and date of manufacture. The certification shall be accompanied by 1/2 liter (one-pint) samples each of Part A and Part B. After approval by the Division of Aeronautics, certification by the epoxy manufacturer shall be submitted for each batch used. New independent laboratory certified test results and samples for testing by the Division of Aeronautics shall be submitted any time the manufacturing process or paint formulation is changed. All costs of testing (other than tests conducted by the Division of Aeronautics) shall be borne by the Manufacturer.
- (p) Acceptance samples, shall consist of two 1/2-L (one pint) samples of Part A and one 1/2 L (one pint) of Part B, of each lot of paint. The samples shall be submitted to the Division of Aeronautics for testing, together with a manufacturer's certification. The certification shall state the formulation for the lot represented is essentially identical to that used for qualification testing. All acceptance samples shall be taken by a representative of the Illinois Department of Transportation. The epoxy pavement marking materials shall not be

used until tests are completed and they have met the requirements as set forth herein.

- (q) When concrete pavement is to be painted, it shall attain an age of 28 days before the curing compound is removed and the paint is applied.

620-2.3 REFLECTIVE MEDIA. The glass beads shall be sampled and pre-approved for use by the Illinois Department of Transportation. Type A beads shall be used on all thermoplastic, epoxy, and solvent-based pavement marking and shall be free of silicones, waxes, oils, or other coatings, and pass all relevant I.D.O.T. tests. Type B beads shall be used with water-based pavement marking and shall have a silicone, moisture resistant coating and pass I.D.O.T. tests for moisture resistance, as well as packaging specifications and any other relevant I.D.O.T. tests.

CONSTRUCTION METHODS

620-3.3 PREPARATION OF SURFACE

ADD: The following sentence at the end of the first paragraph:

Markings shall be applied to the cleaned surface on the same calendar day. If this cannot be accomplished, the surface area shall be re-cleaned prior to applying the markings. No markings shall be placed until the Resident Engineer approves the cleaning.

620-3.5 APPLICATION

Change the first sentence of the second paragraph to read:

The paint shall be mixed in accordance with the manufacturer’s instructions and applied to the pavement with a marking machine in two applications, each at the rate(s) shown in Table 1.

ADD: Table 1.

Table 1. Application Rates for Paint and Glass Beads

Paint Type	Paint Square feet per gallon, ft ² /gal (Square meters per liter, m ² /l) (Per application)	Glass Beads, Type I, Gradation A Pounds per gallon of paint, lb/gal (Kilograms per liter of paint, kg/l) (Applied to second coat only)
Waterborne	115 ft ² /gal maximum (2.8 m ² /l)	7 lb/gal minimum (0.85 kg/l)
Epoxy	90 ft ² /gal maximum (2.2 m ² /l)	15 lb/gal minimum (1.8 kg/l)

DELETE: The last sentence of the forth paragraph of Article 620-3.5.

ADD:

When painting Item 402 Porous Friction Course with waterborne paints, the paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine from two directions at the rate(s) shown in Table 1 from each direction.

ADD: After the fourth paragraph:

Glass spheres shall not be required on black marking.

ADD:

620-3.7 PAVEMENT MARKING REMOVAL

The Contractor shall remove existing and temporary markings as shown in the plans or as directed by the Engineer using sandblasting, waterblasting, shot blasting, or other approved method.

ADD:

620-3.8 TEMPORARY PAVEMENT MARKING

Temporary pavement marking shall be applied with one coat at the rate shown in Table 1.

Glass beads will be required where shown on the plans.

METHOD OF MEASUREMENT

620-4.1 ADD: When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

The quantity of permanent pavement marking, temporary pavement marking and removal of permanent and temporary markings to be paid for shall be the number of square feet of painting or removal performed in accordance with the specifications and accepted by the Engineer.

BASIS OF PAYMENT

620-5.1 DELETE: This section.

ADD: Payment shall be made at the contract unit price per square foot for pavement marking, temporary marking, and pavement marking removal. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item. The application of the reflective media shall be considered incidental to the item of pavement marking for which it is used and no additional compensation will be allowed.

Payment will be made under:

- Item AR620520 -- Pavement Marking – Waterborne -- per square foot.
- Item AR620525 -- Pavement Marking – Black Border -- per square foot.
- Item AR620530 -- Pavement Marking – Epoxy -- per square foot.
- Item AR620590 -- Temporary Marking -- per square foot.
- Item AR620900 -- Pavement Marking Removal -- per square foot.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 625 TAR EMULSION PROTECTIVE SEAL COAT

Item 625 “Tar Emulsion Protective Seal Coat” is modified as outlined below:

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

DESCRIPTION

625-1.1 DELETE: This section.

ADD: This item shall consist of an application of a rubberized coal-tar emulsion seal coat, with- mineral aggregate, and with the use of a latex rubber, which may or may not contain a silicone additive applied on an existing, previously prepared bituminous surface, in accordance with these specifications for the area shown on the plans or as designated by the Engineer.

625-1.2 QUANTITIES AND COMPOSITION OF MATERIALS PER SQUARE YARD.

DELETE: This section.

ADD: The rubberized coal-tar pitch emulsion seal coat shall consist of a mixture of coal-tar pitch emulsion, water, latex rubber and aggregate in the proportions shown in Table 1. The amount of water added to the rubberized coal-tar pitch emulsion sand slurry, to achieve application consistency, shall not exceed 100 percent of the coal-tar pitch emulsion. The amount of water added to the coal-tar pitch emulsion sand slurry shall not exceed 100 percent of the coal-tar pitch emulsion. The final composition shall be determined by the Engineer within the limitations of Table 1.

TABLE 1. COMPOSITION OF MIXTURE

Type of Seal Coat	Water gal./gal. of Emul.	Sand lbs./gal. Of Emul.	Rubber gal./gal. of Emul.	Application rate gal./sq. yd. (per app)
Rubberized Sand Slurry	0.70-1.00	6-14	0.07-0.12	0.25-0.55

The rubberized sand slurry coal-tar emulsion seal coat shall consist of two coats applied at a rate specified in Table 1.

MATERIALS

625-2.1 AGGREGATE

DELETE: This section.

ADD: The aggregate shall either be a natural or manufactured product and shall be composed of clean, hard, durable, uncoated particles, free from lumps of clay and all organic matter. The aggregate shall meet the gradation in Table 2, when tested in accordance with ASTM C 136.

TABLE 2. REQUIREMENTS FOR GRADATION OF AGGREGATES

SIEVE	WEIGHT PASSING
No. 16 (1.18 mm)	100
No. 20 (0.85 mm)	85-100
No. 30 (0.60 mm)	15-85
No. 40 (0.40 mm)	2-15
No. 100 (0.15 mm)	0-2

The moisture of the mineral aggregate at the time of batching shall be such that the material will readily flow into the batching box for correct measurement.

625-2.2 BITUMINOUS MATERIALS

DELETE: This section.

ADD: The bituminous material shall be a coal-tar pitch emulsion prepared from a high-temperature, coal-tar conforming to the requirements of ASTM D 490, Grade 12. Oil and water gas tar shall not be used even though they comply with ASTM D 490. The coal-tar pitch emulsion shall conform to all requirements of Fed. Spec. R-P-355 except the water content shall not exceed 50 percent (50%). Alternate materials may be submitted for consideration of the Engineer.

625-2.3 WATER

DELETE: This section.

ADD: The water used in mixing shall be potable and free from harmful soluble salts. The temperature of the water shall be at least 50°F (10°C).

625-2.4 LATEX RUBBER

The rubber shall be a copolymer latex containing 51-70 parts butadiene and 30-49 parts acrylonitrile or styrene with silicones at 3 percent of the rubber content. The average particle size shall be between 300 and 1500 angstroms and the rubber shall be compatible with the coal-tar pitch emulsion used by the Contractor. The rubber must mix homogeneously with the coal-tar emulsion, water, and sand in the proportions specified to produce a mixture that will adequately suspend the sand.

CONSTRUCTION METHODS

625-3.1 WEATHER LIMITATIONS

DELETE: This section.

ADD: The slurry sealing treatment shall not be applied when the surface is wet or when the weather is foggy, when rainy or rain threatens, or when there is a forecast of temperatures below 32°F within 24 hours from the time of placement of the mixture. No mixture shall be placed unless the ambient temperature is at least 50°F and rising, and the temperature on the pavement surface is at least 50°F.

625-3.2 EQUIPMENT AND TOOLS

DELETE: This section.

ADD:

All equipment, tools, and machinery used for handling the materials and for performing any part of the work shall be subject to the approval of the Engineer. All equipment, tools, and machinery shall be kept-clean and shall be maintained in satisfactory working condition at all times. Whenever any equipment, tools, or machinery is found to be unsatisfactory, it shall be changed or improved-as required.

- a. Distributors. Distributors used for the application of the tar emulsion shall be self-propelled, equipped with pneumatic tires, and capable of uniformly applying 0.15 to 0.50 gallons per square yard (0.69 to 2.3 liter per square meter) of tar emulsion over the required width of application. Distributors shall be equipped with removable manhole covers, tachometers, pressure gauges, and volume-measuring devices.
- b. Mixing equipment. The mixing machine shall be a continuous flow mixing unit capable of accurately delivering and proportioning the aggregate, emulsion, rubber and water to a revolving multi-blade twin shafted mixer and discharging the mixed product on a continuous flow basis. The machine shall have sufficient storage capacity for aggregate, emulsion, rubber and water to maintain an adequate supply to the proportioning controls. The machine may be equipped with self-loading devices, which provide for the loading of materials while continuing to place the mixture.

- c. Proportioning devices. Individual volume or weight controls for proportioning each material to be added to the mix, i.e., aggregate, emulsion, rubber and water shall be provided and properly marked. These proportioning devices are usually revolution counters or similar devices and are used in material calibration and for determining the materials output at any time.
- d. Spreading equipment. The slurry sealing mixture shall be spread uniformly by means of a mechanical type spreader box attached to the mixer, equipped with paddles to agitate and spread the materials throughout the box. A front seal shall be provided to insure no loss of the mixture at the pavement contact point. The rear seal shall act as a final strike-off and shall be adjustable. The mixture shall be spread to fill cracks and minor surface irregularities and leave a uniform skid resistant application of the mixture on the surface. The spreader box and rear strike-off shall be so designated and operated that a uniform consistency is achieved to produce a free flowing material to the rear strike-off. The longitudinal joint where two passes join shall be neat appearing, uniform, and lapped. All excess material shall be removed from the job prior to opening the paved area to traffic. The spreader box shall have a suitable means provided to side shift the box to compensate for variation in pavement geometry.
- e. Auxiliary equipment. Suitable crack and surface cleaning equipment, traffic control devices, barricades, hand tools, and support equipment shall be provided as necessary to properly perform the work.
- f. Machine calibration. Each mixing unit to be used in the performance of the work shall be calibrated in the presence of the Resident Engineer prior to the start of the work. At the option of the Engineer, previous calibration documentation data covering the exact materials to be used may be acceptable, provided that the documentation data was made during the previous 6 months. The documentation shall include the individual calibration of each material at various settings, which can be related to the machine's metering devices.

625-3.3 SURFACE PREPARATION.

ADD: Prior to placing the slurry sealing mixture, unsatisfactory areas shall be repaired and the surface of the pavement shall be clean and free from any vegetation, dust, dirt, or other loose foreign matter, grease oil, or any type of objectionable surface film. The pavement shall be swept with hand brooms or power sweepers or cleaned with pressure streams of water, provided that flushing with pressure streams of water shall not be permitted in areas having significant amounts of surface cracking. Grates, manholes, tie downs, or other such appurtenances shall be protected from the surfacing material.

Areas that have been subjected to fuel or oil spillage shall be wire brushed to remove any dirt accumulations. The area shall then be primed with tack coat to prevent the sea coat from debonding.

No separate payment will be made for surface preparation. The cost of the surface preparation shall be considered incidental to the unit price bid for this item.

625-3.6 APPLICATION OF SAND SLURRY.

DELETE: This section.

ADD: When the emulsion, aggregate, waters and rubbers are blended, the material shall be premixed to produce a homogeneous mixture of uniform consistency. The quantities of materials to be combined in each batch shall be in accordance with the proportions shown in Table 1.

Before application, the materials shall be proportioned accurately and mixed by suitable mixing equipment. The emulsion and the water shall first be charged into the mixer and blended to a desired consistency. Aggregate shall then be added at a slow and uniform rate while the mixing is continued. The latex rubber shall then be added. After all the constituents are in the mixer, the mixing shall continue for approximately five minutes or longer, if necessary. The mixing shall produce a smooth, free flowing homogeneous mixture of uniform consistency. Slow mixing shall be continuous from the time the bitumen is placed into the mixer until the slurry is applied by distributor truck or poured into the spreading equipment. During the entire mixing process, no breaking, segregating, or hardening of the emulsion nor balling, lumping, or swelling of the aggregate shall be permitted. The slurry shall be applied at a uniform rate to provide the desired amount. A sufficient amount of slurry shall be fed in the spreader box to keep a full supply against the full width of the squeegee, so that complete coverage of all surface voids and cracks is obtained.

In areas where a spreader box cannot be used, the slurry shall be applied by means of a hand squeegee.

Upon completion of the work, the seal coat shall have no pinholes, bare spots, or cracks through which liquids or foreign matter could penetrate to the underlying pavement. The finished surface shall present a uniform texture.

The rubberized sand slurry coal-tar emulsion seal coat shall consist of two coats applied at a rate specified in Table 1.

Each application shall be allowed to dry thoroughly before the next coat is applied.

625-3.7 CURING

DELETE: This section.

ADD: The mixture shall be permitted to dry for a minimum of 24 hours after the final application before opening to traffic and shall be sufficiently cured to drive over without damage to the seal coat. Any damage to the uncured mixture will be the responsibility of the contractor to repair.

625-3.9 CONTRACTOR'S CERTIFICATION

DELETE: This section.

ADD: The Contractor shall furnish the manufacturer's certification that each consignment of emulsion shipped to the project meets the requirements of Fed. Spec. R-P-355, except the water content shall not exceed 50 percent. The Contractor shall furnish certification to the Engineer that the latex rubber shipped to the project meets the requirements of the material specified in paragraph 2.4. The certifications shall be delivered to the Engineer prior to the beginning of work. The manufacturer's certification for the emulsion and rubber shall not be interpreted as a basis for final acceptance. Any certification received shall be subject to verification by testing samples received for project use.

METHOD OF MEASUREMENT

625-4.1

DELETE: This section.

ADD: When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

This item shall be measured by the number of square yards of pavement surface area satisfactorily constructed in conformance with these specifications. No separate measurement for emulsified asphalt and aggregate will be made for payment.

BASIS OF PAYMENT

625-5.1

DELETE: This section.

ADD: Payment shall be made at the contract unit price per square yard for Tar Emulsion Seal Coat. These prices shall be full compensation for furnishing all materials, for preparing, mixing and applying these materials, and for all labor, equipment, tools and incidentals necessary to satisfactorily complete the item.

Payment will be made under:

Item AR625510 -- Tar Emulsion Seal Coat -- Per Square Yard

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 161 WIRE FENCE WITH STEEL POSTS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 161 “Wire Fence With Steel Posts (Class C)” is modified as outlined below:

DESCRIPTION

161-1.1 REVISE: The last sentence of the paragraph to read as follows:

The Class “C” fence and gates will be installed at the locations shown on the construction plans and in accordance with this specification and in accordance with the Illinois Department of Transportation’s Standard Specifications for Road and Bridge Construction, latest edition, IDOT Standard 665001-01. The Class “C” fence shall be of the height shown on the construction plans. The proposed gates will be of the height and width shown on the construction Plans.

ADD: This work shall also include Class C fence and gate relocations, and Class C fence and gate removals at the locations shown on the plans.

MATERIALS

161-2.1 WIRE

REVISE: Section (a) to read as follows:

(a) Woven wire (zinc coated). The woven wire fencing shall be 39 inch field fence with top and bottom wires No. 10 ASW gauge, and filler and stay wires No. 12-1/2 ASW gauge. Stay wires shall be spaced 6 inches apart. All wire shall be smooth galvanized steel wire conforming to AASHTO M 279, Class 3.

REVISE: Section (b) to read as follows:

(b) Barbed Wire (zinc coated). Zinc coated barbed wire shall be 2-strand twisted No. 12-1/2 ASW gauge galvanized steel wire with 4 point barbs of No. 14 ASW gauge galvanized steel wire. All wire shall conform to AASHTO M 280, Class 3 with a minimum coating of 0.80 ounces per square foot of wire surface. The barbs shall be spaced approximately 5 inches apart.

CONSTRUCTION METHODS161-3.1 GENERAL

ADD:

Any disturbed area, with the exception of farming areas, shall be seeded and mulched in accordance with Items 901 and 908 of the Standard Specifications. The cost of seeding and mulching of the areas disturbed by this work shall be incidental to the associated item of work

161-3.3 INSTALLING POSTS Add the following to this Section:

A high early strength concrete may be used. The concrete mix design will be approved for use by the Illinois Division of Aeronautics prior to using it on the project.

161-3.7 INSTALLING GATES. Revise the first sentence of this section to read as follows:

The gates shall be hung on gate fittings as shown on the construction plans

ADD:

161-3.10 FENCE AND GATE REMOVAL

This work shall consist of the removal and disposal of existing wire fence and gates. The fence shall be removed completely including posts and foundations. The fence posts shall be pulled, not cut off. All holes shall be filled and compacted. The removed material shall be disposed of off airport property.

ADD:

161-3.11 FENCE AND GATE RELOCATION

The Contractor will remove all fence, gates, posts (metal and/or wood), concrete, fence fabric, clips and other miscellaneous fittings associated with the fence to be relocated. The fence shall then be constructed and all reusable materials will be reassembled in the proposed location shown on the construction plans. The existing gate, corner and anchor posts will be replaced with new posts, the old posts will be disposed off of airport property. The new posts will be considered incidental to this pay item and no additional compensation will be provided for the new posts or the disposal of the old posts off of airport property.

METHOD OF MEASUREMENT

ADD:

- 161-4.2 Class C Fence Relocation shall be measured from outside to outside of end posts, gate posts, or corner posts and shall be the length of relocated fence actually constructed, except for the space occupied by the gates.
- 161-4.3 Class C Fence Removal to be paid for shall be the actual length of fence (including post widths) removed, except for the space occupied by the gates.
- 161-4.4 Class C Gate Relocations shall be measured in units for each gate relocated and accepted.
- 161-4.5 Class C Gate Removals shall be measured in units for each gate removed.

BASIS OF PAYMENT

ADD:

- 161-5.2 Payment shall be made at the contract unit price per linear foot for Class C Fence Relocation. This price shall be full compensation for furnishing all materials and for all preparation, removals, relocation, erection, installation and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.
- 161-5.3 Payment shall be made at the contract unit price per linear foot for Class C Fence Removal. This price shall be full compensation for furnishing all materials and for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.
- 161-5.4 Payment shall be made at the contract unit price per each for existing Class C Gate relocation. This price shall be full compensation for furnishing all materials and for all preparation, removals, relocation, erection, installation and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.
- 161-5.5 Payment shall be made at the contract unit price per each for Class C Gate Removal. This price shall be full compensation for furnishing all materials and for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

- Item AR161510 -- Class C Fence -- per linear foot.
- Item AR161604 -- Class C Gate - 4' -- per each.
- Item AR161612 -- Class C Gate - 12' -- per each.
- Item AR161616 -- Class C Gate - 16' -- per each.
- Item AR161618 -- Class C Gate - 18' -- per each.
- Item AR161620 -- Class C Gate - 20' -- per each.
- Item AR161624 -- Class C Gate - 24' -- per each.
- Item AR161630 -- Class C Gate - 30' -- per each.
- Item AR161900 -- Remove Class C Fence -- per linear foot.
- Item AR161910 -- Remove Class C Gate -- per each.
- Item AR161960 -- Relocate Class C Fence -- per linear foot.
- Item AR161961 -- Relocate Existing Gate -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 162 CHAIN-LINK FENCES

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 162 “Chain-Link Fence (Class E)” is modified as outlined below:

DESCRIPTION

162-1.1 REVISE: The first paragraph to read as follows:

This item of work shall consist of furnishing and installing new Class E (chain link) fence and gates at the locations shown on the construction plans and in accordance with this specification and in accordance with the Illinois Department of Transportation’s Standard Specifications for Road and Bridge Construction, latest edition, IDOT Standard 664001-01. The Class “E” fence and gates shall be of the height and configuration as shown on the construction plans.

This work shall also include Class E fence relocations, Class E gate relocations, Class E fence removals and and Class E gate removals at the locations shown on the plans.

MATERIALS

162-2.1 FABRIC

ADD: The following to the list of fabric types:

Zinc-5% aluminum-mischmetal alloy-coated steel

Rewrite paragraph (a) (1) as follows:

CHANGE: “AASHTO M181, Type I, Class B” to “AASHTO M181, Type I, Class D”

REWRITE: Paragraph (a) (2) as follows:

CHANGE: “AASHTO M181” to “AASHTO M181, Type II”

REWRITE: Paragraph (a) (3) as follows:

CHANGE: “AASHTO M181” to “AASHTO M181, Type III”

REWRITE: Paragraph (a) (4) as follows:

CHANGE: “AASHTO M181, Type IV bonded” to “AASHTO M181, Type IV, Class B”

ADD: Paragraph (a) (5) as follows:

(5) Zinc-5% aluminum-mischmetal alloy-coated steel shall conform to the requirements of ASTM F1345, Class 2.

162-2.2 BARBED WIRE Add the following:

Three strands of barbed wire shall be used above the top rail on arms as shown on the construction plans. Barbed wire shall have 4 point barbs spaced a maximum of 5” apart. The barbs shall be sharp and tightly wrapped about a uniformly twisted 12-1/2 (.0985”) gauge line wires, galvanized or aluminized.

162-2.3 FENCE POSTS, POST TOPS AND EXTENSIONS, RAILS, GATES, BRACES, STRETCHERBARS, AND CLIPS

ADD: Top rail will be required unless specified otherwise. The top rail shall be 1.66" O.D. and 1.83 lbs/ft with minimum bending strength of 202 lbs at center of a 10’ span.

REWRITE: Paragraph (a) (1) as follows:

CHANGE: “ASTM A120” to “ASTM F1083”

REWRITE: paragraph (a) (2) as follows:

CHANGE: “ASTM A120” to “ASTM F1083”

REWRITE: Paragraph (a) (2) (1) as follows:

CHANGE: “ASTM A120” to “ASTM F1083”

REWRITE: Paragraph (a) (3) as follows:

CHANGE: “ASTM A120” to “ASTM F1083”

Add paragraph (a) (6)

(6) Steel pipe with Zinc-5% aluminum mischmetal alloy coating conforming to ASTM F1234 Group IC, Type C

The metal pipe for 8-ft and 10-ft chain link fence shall meet the requirements of article 1006.27(b) of IDOT’s Standard Specifications for Road and Bridge Construction and shall conform to the following minimum requirements:

8-ft Chain Link Fence:

Line posts – 2.375” O.D. Sch. 40 - 3.65 lbs/ft or SS40 3.11 lbs/ft.

Terminal posts – 2.875” O.D. Sch. 40 - 5.79 lbs/ft or SS40 4.64 lbs/ft.

Gate posts – 4” O.D. Sch. 40 - 9.11 lbs/ft.

10-ft Chain Link Fence

Line posts – 2.375” O.D. (round) Schedule 40 weighing 3.65 lbs/ft.

Terminal posts – 2.875” O.D. (round) Schedule 40 weighing 5.79 lbs/ft.

Gate posts – 6.625” O.D. (round) Schedule 40 weighing 18.97 lbs/ft.

(c) Gates

REVISE: This section to read as follows:

Gates shall be of the type and size shown on the plans and shall conform to the details shown on the plans.

Slide Gates

Slide gates shall be cantilever gates conforming to the dimensions and details shown on the plans. Gate Operators, card readers, and electric power and control shall be as detailed on the plans and as specified in the Special Provisions.

Pedestrian and Drive Gates:

Drive gates shall be two swing gates placed side by side to span the required opening as shown on the plans. Gate frames shall be constructed of 2” O.D. galvanized pipe. Gate frame shall be welded at all corners to form a rigid panel, and filled with fabric, and topped with three strand barbed wire when specified for the fence. The hinges shall allow the gate to swing 180 degrees. The latches shall be heavy duty and have a provision for a pad lock.

162-2.4 WIRE TIES AND TENSION WIRE

CHANGE: “AASHTO M181” to “AASHTO M181, Type I Class 2 or Type II”

ADD: The following:

The top tension wire will be deleted in lieu of the top rail when top rail is required. The bottom tension wire is required.

162-2.7 ADD: The following:

A high early strength concrete may be used. The concrete mix design shall be approved for use by the Illinois Division of Aeronautics prior to using it on the project.

ADD:

162-2.8 SIGNS

The contractor shall provide and install Restricted Area signage as shown on the plans.

CONSTRUCTION METHODS162-3.3 INSTALLING POST

ADD: The following to article 664.04:

All posts shall be set to a minimum depth of 36 inches below the existing ground line. The fence shall not be erected until the concrete encasement around the post has cured 7 days or reached a compressive strength of 2,500 psi. If a high-early strength concrete is used the fence may be erected once the concrete has reached a compressive strength of 2,500 psi. The contractor will be responsible for concrete testing other than at 7 and 14 days.

ADD:

162-3.10 FENCE AND GATE REMOVAL

This item shall consist of complete removal of existing fence and gates (fabric, posts, signs and other hardware) as shown on the plans. The Airport Management shall have the option of keeping the removed fence. If the Airport Management chooses, the removed fence material shall become the property of the Contractor, and shall be removed from the airport property.

162-3.11 FENCE AND GATE RELOCATION

The Contractor will remove all fence, gates, posts (metal and/or wood), concrete, fence fabric, clips and other miscellaneous fittings associated with the fence to be relocated. The fence shall then be constructed and all reusable materials will be reassembled in the proposed location shown on the construction plans. The existing gate, corner, line and anchor posts will be replaced with new posts, the old posts will be disposed off of airport property. The new posts will be considered incidental to this pay item and no additional compensation will be provided for the new posts or the disposal of the old posts off of airport property. The new posts will be considered incidental to this pay item and no additional compensation will be provided for the new posts or the disposal of the old posts off of airport property.

METHOD OF MEASUREMENT

ADD:

- 162-4.2 Class E Fence Relocation shall be measured from outside to outside of end posts, gate posts, or corner posts and shall be the length of relocated fence actually constructed, except for the space occupied by the gates.
- 162-4.3 Class E Fence Removal to be paid for shall be the actual length of fence (including post widths) removed, except for the space occupied by the gates.
- 162-4.4 Class E Gate Relocations shall be measured in units for each gate relocated and accepted.
- 162-4.5 Class E Gate Removals shall be measured in units for each gate removed.

BASIS OF PAYMENT

ADD:

- 162-5.2 Payment shall be made at the contract unit price per linear foot for Class E Fence Relocation. This price shall be full compensation for furnishing all materials and for all preparation, removals, relocation, erection, installation and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.
- 162-5.3 Payment shall be made at the contract unit price per linear foot for Class E Fence Removal. This price shall be full compensation for furnishing all materials and for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.
- 162-5.4 Payment shall be made at the contract unit price per each for existing Class E Gate relocation. This price shall be full compensation for furnishing all materials and for all preparation, removals, relocation, erection, installation and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.
- 162-5.5 Payment shall be made at the contract unit price per each for Class E Gate Removal. This price shall be full compensation for furnishing all materials and for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

- Item AR162504 -- Class E Fence 4' -- per linear foot.
- Item AR162506 -- Class E Fence 6' -- per linear foot.
- Item AR162508 -- Class E Fence 8' -- per linear foot.
- Item AR162510 -- Class E Fence 10' -- per linear foot.
- Item AR162604 -- Class E Gate - 4' -- per each.
- Item AR162605 -- Class E Gate - 5' -- per each.
- Item AR162606 -- Class E Gate - 6' -- per each.
- Item AR162610 -- Class E Gate - 10' -- per each.
- Item AR162612 -- Class E Gate - 12' -- per each.
- Item AR162614 -- Class E Gate - 14' -- per each.
- Item AR162616 -- Class E Gate - 16' -- per each.
- Item AR162618 -- Class E Gate - 18' -- per each.
- Item AR162620 -- Class E Gate - 20' -- per each.
- Item AR162624 -- Class E Gate - 24' -- per each.
- Item AR162628 -- Class E Gate - 28' -- per each.
- Item AR162630 -- Class E Gate - 30' -- per each.
- Item AR162712 -- Electric Gate – 12' -- per each.
- Item AR162714 -- Electric Gate – 14' -- per each.
- Item AR162715 -- Electric Gate – 15' -- per each.
- Item AR162716 -- Electric Gate – 16' -- per each.
- Item AR162718 -- Electric Gate – 18' -- per each.
- Item AR162720 -- Electric Gate – 20' -- per each.
- Item AR162722 -- Electric Gate – 22' -- per each.
- Item AR162724 -- Electric Gate – 24' -- per each.
- Item AR162725 -- Electric Gate – 25' -- per each.
- Item AR162728 -- Electric Gate – 28' -- per each.
- Item AR162730 -- Electric Gate – 30' -- per each.
- Item AR162900 -- Remove Class E Fence -- per linear foot.
- Item AR162908 -- Remove Electric Gate -- per each.
- Item AR162910 -- Remove Class E Gate -- per each.
- Item AR162920 -- Remove Manual Slide Gate -- per each.
- Item AR162960 -- Relocate Class E Fence -- per linear foot.
- Item AR162961 -- Relocate Gate – 4' -- per each.
- Item AR162962 -- Relocate Gate – 24' -- per each.
- Item AR162963 -- Relocate Gate – 5' -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 701 PIPE FOR STORM SEWERS AND CULVERTS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 701 “Pipe For Storm Sewers And Culverts” is modified as outlined below:

MATERIALS

701-2.2, 2.4

DELETE: These sections.

701-2.3 CONCRETE

ADD: Concrete for all connections to existing and proposed drainage structures shall conform to Item 610.

701-2.5 RUBBER GASKET JOINTS

ADD: Rubber gasket joints will be required on all reinforced concrete pipe.

CONSTRUCTION METHODS

701-3.3 CRADLE

DELETE: Entire section.

ADD:

Granular cradle shall be constructed and compacted prior to the placement of the storm sewer for the entire length of the pipe. The granular cradle material shall consist of crushed stone meeting the material requirements set forth in Item 208-2.3. The material gradation shall be as follows:

SIEVE SIZE PERCENT PASSING

	Dry Trench Conditions	Wet Trench Conditions
<u>Sieve Size</u>	<u>(IDOT CA-6)</u>	<u>(IDOT CA-7)</u>
1-1/2"	100	100
1"	95 ± 5	95 ± 5
1/2"	75 ± 15	45 ± 15
No. 4	43 ± 13	5 ± 5
No. 16	25 ± 15	-----
No. 200	8 ± 4	-----

All granular cradles shall be compacted to 90% of the maximum density, in accordance with ASTM D-698, Method A or B (Standard Proctor).

701-3.7 BACKFILLING

ADD: At the locations shown on the plans (existing, proposed and future paved areas), the trench excavation shall be backfilled with select granular backfill material. The material shall meet the requirements set forth for granular cradle for dry trench conditions as set forth in Section 701-3.3 "CRADLE". Selected granular backfill materials shall be compacted in lifts no greater than 6" thick to 95% of the maximum density in accordance with ASTM D-698, Method C or D (Standard Proctor).

ADD:

701-3.11 PIPE REMOVAL

ADD: This work shall consist of removal of existing pipes of various types and sizes. Trenches resulting from pipe removal shall be backfilled and compacted in accordance with Item 152, Excavation and Embankment. Pipe shall be disposed of by the Contractor off airport property.

ADD:

701-3.12 SEQUENCING OPERATIONS AND MAINTAINING DRAINAGE

The Contractor shall sequence and conduct his operations in such a manner as to maintain positive drainage at all times. It shall be the Contractor's responsibility to provide temporary ditches, pumps, inlets, culvert pipes and other items and appurtenances which might be required to achieve maintenance of drainage during construction. All such work will be incidental to the project. This work shall include maintenance of field tile flows.

The Contractor shall pay particular attention to locating field tiles while excavating.

METHOD OF MEASUREMENT

701-4.1 ADD: Measurement of pipe will be based on the size and class identified on the plans. The size and class will be listed in the bid items.

Round pipe sizes are defined as internal diameter in inches. The class of pipe shall be as shown on the plans. The class of pipe or culvert shown on the plans is not based only on the depth of cover, but takes into account existing depth of cover, potential future depth of cover, potential future vehicle loadings and anticipated construction loadings.

BASIS OF PAYMENT

701-5.1 DELETE: Entire section.

ADD: The contract unit price per linear foot for storm sewers and pipe removal shall be full payment for furnishing and installing all materials, and for all excavation, earth backfill, granular cradle, select granular backfill placement, compaction, connections to existing structures, concrete collars, and surface grading; and for all labor, equipment and tools necessary to complete this item of the size and type to the satisfaction of the Engineer.

All farm field tiles encountered during the construction must be either protected, replaced, or connected to the proposed storm sewers and culverts as directed by the Resident Engineer.

Protection, replacement, and connection of farm field tiles will not be measured for payment, but shall be considered incidental to the associated storm sewer or culvert.

Backfill required for pipe installed under proposed or future pavements will not be paid for separately, but shall be considered incidental to the pipe.

Backfill required for pipe removal under proposed or future pavements will not be paid for separately, but shall be considered incidental to the pipe.

Payment will be made under:

- Item AR701412 -- 12" RCP, Class III -- per linear foot.
- Item AR701415 -- 15" RCP, Class III -- per linear foot.
- Item AR701418 -- 18" RCP, Class III -- per linear foot.
- Item AR701424 -- 24" RCP, Class III -- per linear foot.
- Item AR701430 -- 30" RCP, Class III -- per linear foot.
- Item AR701436 -- 36" RCP, Class III -- per linear foot.
- Item AR701442 -- 42" RCP, Class III -- per linear foot.
- Item AR701448 -- 48" RCP, Class III -- per linear foot.
- Item AR701512 -- 12" RCP, Class IV -- per linear foot.
- Item AR701515 -- 15" RCP, Class IV -- per linear foot.
- Item AR701518 -- 18" RCP, Class IV -- per linear foot.
- Item AR701524 -- 24" RCP, Class IV -- per linear foot.
- Item AR701530 -- 30" RCP, Class IV -- per linear foot.
- Item AR701536 -- 36" RCP, Class IV -- per linear foot.

Item AR701542 -- 42" RCP, Class IV -- per linear foot.
Item AR701548 -- 48" RCP, Class IV -- per linear foot.
Item AR701900 -- Remove Pipe -- per linear foot.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 705 PIPE UNDERDRAINS FOR AIRPORTS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 705 “Pipe Underdrains For Airports” is modified as outlined below:

MATERIALS

705-1.1 DELETE: Third paragraph.

705-2.2 - 2.11, 705-2.14

DELETE: These sections.

705-2.12 CORRUGATED POLYETHYLENE (PE) TUBING AND IGS FITTINGS

ADD: All perforated underdrains shall be perforated corrugated polyethylene (PE) pipe of the diameter shown in the plans, with sock conforming to the requirements of Heavy Duty ASTM F-405 and pipe shall be referred to as C.P.P.U.P. Heavy Duty Tubing shall be used. The perforated underdrain shall be wrapped with a filter fabric envelope.

All non-perforated underdrain shall be ASTM D3034 PVC pipe of the diameter shown in the plans without Filter fabric envelope.

705-2.13 FILTER FABRIC ENVELOPES FOR PERFORATED (PE) TUBING

DELETE: Entire section.

ADD:

The fabric envelope for encasing pipe underdrains may be either a knitted, woven, or nonwoven fabric.

(a) Fabric Materials

- (1) Knitted Fabric. Knitted fabric envelope shall be an approved continuous one-piece knitted polyester material that fits over the pipe underdrain like a sleeve. It shall be knitted of continuous 150-denier polyester yarn and shall be free from any chemical treatment or coating that might significantly reduce porosity and permeability.

- (2) Woven or Nonwoven Fabric. The filaments for woven or nonwoven fabric shall be polypropylene, polyester, or polyethylene. The filaments must be dimensionally stable (i.e., filaments must maintain their relative position with respect to each other) and resistant to delamination. The filaments must be free from any chemical treatment or coating that might significantly reduce porosity and permeability. Nonwoven fabric shall be needle punched.
- (3) Physical Properties. The physical properties for both knitted and woven or nonwoven fabric shall conform to the following:

	PHYSICAL PROPERTIES (ENGLISH)	
	KNITTED	WOVEN OR NONWOVEN
Min. Weight (oz./sq. yd.)	3.5 applied ASTM D 3887 4.8 relaxed ASTM D 3887	3.5 ASTM D 3776
Min. Wet Grab Tensile Strength (lbs.)	50 ASTM D 4632	100 ^{1/} ASTM D 4632
Grab Elongation @ Break (%)	-----	20 min. ^{1/} ASTM D 4632
Equivalent Opening Size (EOS No.)	30 min. ^{2/} Corps of Engrs. CW-02215	30 min. nonwoven ^{2/} 50 min. woven ^{2/}
Burst Strength (PSI)	100 min. ^{2/} ASTM D 3887	-----

	PHYSICAL PROPERTIES (METRIC)	
Min. Weight (g/m ²)	120 applied ASTM D 3887 160 relaxed ASTM D 3887	120 ASTM D 3776
Min. Wet Grab Tensile Strength (N)	225 ASTM D 4632	450 ^{1/} ASTM D 4632
Grab Elongation @ Break (%)	-----	20 min. ^{1/} ASTM D 4632
Equivalent Opening Size (EOS No.)	600 µm min. ^{2/} Corps of Engrs. CW-02215	600 µm nonwoven ^{2/} 300 µm min. woven ^{2/}
Burst Strength (kPa)	690 min. ^{2/} ASTM D 3887	-----

1/ For woven fabric, test results shall be referenced to orientation with warp or fill, whichever the case may be.

2/ Manufacturer's certification to meet test requirements.

- (b) Handling and Storage. The knitted fabric envelope shall be applied to the pipe underdrain in the shop so as to maintain a uniform applied weight. Woven and nonwoven fabric or underdrains with knitted fabric envelope shall be delivered to the jobsite in such manner as to facilitate handling and incorporation into the work without damage. Fabric envelope materials shall be stored in UV-resistant bags until just prior to installation. In no case shall the fabric be stored or exposed to direct sunlight that might significantly diminish its strength or toughness. Torn or punctured fabric envelope shall not be used.

705-2.15 POROUS BACKFILL

DELETE: Table 1.

ADD: Porous backfill material shall conform to the requirements for IDOT CA-14 or IDOT CA-16.

ADD:

705-2.16 CONCRETE

Concrete for connections to drainage structures or other miscellaneous items shall conform to Item 610, Structural Portland Cement Concrete.

CONSTRUCTION METHODS

705-3.3 LAYING AND INSTALLING PIPE

DELETE: Contents of this section.

ADD: Corrugated polyethylene tubing underdrains shall be constructed as follows:

Trenches shall be excavated to the dimensions and grades required by the plans or as directed by the Engineer.

Prior to installing the pipe, a 4" minimum layer of porous backfill meeting the requirements of Paragraph 2.15 shall be constructed in the bottom of the trench.

Perforated, corrugated polyethylene tubing with filter fabric sock shall be seated in the porous backfill and held firmly in place, while porous backfill meeting the requirements of Paragraph 2.15 is placed to a height of 5 inches \pm 1 inch above the tubing. After the first lift is compacted to the satisfaction of the Engineer, the remainder of the backfill shall be placed and compacted.

Perforated, corrugated polyethylene tubing shall be laid true to grade and shall not be stretched more than 5% during installation.

The contractor shall be required to establish control grade on the underdrain pipe to ensure the pipe is installed at the proper elevation. Contract grade elevations are to be provided to the resident engineer upon request.

705-3.4 MORTAR

DELETE: This section.

705-3.5 JOINTS IN CLAY OR CONCRETE PIPE

DELETE: Entire section.

705-3.6 BACKFILLING

ADD: Backfilling for perforated underdrains shall be as detailed in the plans.

705-3.7 CONNECTIONS

ADD: Connection of the pipe underdrain into the proposed drainage structures shown on the plans shall be sealed with structural portland cement concrete, as specified in Item 610.

ADD:

705-3.9 HEADWALLS, END SECTIONS, INSPECTION HOLES, COLLECTION STRUCTURES AND CLEANOUTS FOR UNDERDRAINS

Headwalls, end sections, inspection holes, collection structures and cleanouts for underdrains shall be constructed in accordance with the applicable sections of Item 751 and Item 752.

METHOD OF MEASUREMENT

705-4.1 DELETE: Second sentence.

ADD: The number of headwalls, end sections, inspection holes, collection structures and cleanouts for underdrains shall be measured by the unit.

705-4.2 DELETE: This section.

BASIS OF PAYMENT

705-5.1 DELETE: This section.

ADD: The contract unit price per linear foot for underdrains shall be full compensation for furnishing and installing all materials, excavation, and for all labor, equipment and tools necessary to complete this item of the size and type to the satisfaction of the Engineer. The filter fabric pipe envelope, and porous backfill No. 2 shall be considered incidental to the underdrain and shall not be measured for payment purposes.

The contract unit price per each for headwalls, end sections, inspection holes, collection structures and cleanouts for underdrains shall be full compensation for furnishing and installing all materials, excavation, and for all labor, equipment and tools necessary to complete this item to the satisfaction of the Engineer

All farm field tiles encountered during the construction must be protected, replaced, or connected to the proposed storm sewers and culverts, as directed by the Engineer. Protection, replacement, and connection of farm field tiles will not be measured for payment, but shall be considered incidental to the associated underdrain.

Payment for underdrain removal and underdrain structure removal shall not be paid for separately, but shall be considered incidental to the project.

Downspout connections to the underdrain shall not be paid for separately, but shall be incidental to underdrain.

Payment will be made under:

- Item AR705524 -- 4" Perforated Underdrain w/Sock -- per linear foot.
- Item AR705526 -- 6" Perforated Underdrain w/Sock -- per linear foot.
- Item AR705528 -- 8" Perforated Underdrain w/Sock -- per linear foot.
- Item AR705530 -- 10" Perforated Underdrain w/Sock --- per linear foot.
- Item AR705544 -- 4" Non Perforated Underdrain -- per linear foot.
- Item AR705546 -- 6" Non Perforated Underdrain -- per linear foot.
- Item AR705548 -- 8" Non Perforated Underdrain -- per linear foot.
- Item AR705550 -- 10" Non Perforated Underdrain -- per linear foot.
- Item AR705610 -- Concrete Headwall for Underdrain -- per each.
- Item AR705620 -- Underdrain End Section -- per each.
- Item AR705630 -- Underdrain Inspection Hole -- per each.
- Item AR705635 -- Underdrain Collection Structure -- per each.
- Item AR705640 -- Underdrain Cleanout -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 751 MANHOLES, CATCH BASINS, INLETS, & INSPECTION HOLES

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 751 “Manholes, Catch Basins, Inlets, & Inspection Holes” is modified as outlined below:

DESCRIPTION

751-1.1 ADD: This item consists of:

- Construction of Inlets.
- Construction of Manholes.
- Adjustment of Existing Inlet and Manhole Structures.

MATERIALS

751-2.1 BRICK

DELETE: This Section.

751-2.2 MORTAR

DELETE: References to brick construction.

751-2.5 CORRUGATED METAL

DELETE: These Sections.

751-2.6 FRAMES, COVERS AND GRATES

ADD: Frame and grates shall be of the type shown in the plans.

ADD: Gray iron castings shall conform to the requirements of AASHTO M105. Tensile test specimens shall be furnished without charge. All castings shall also meet the following requirements:

All frames having circular lids shall have the bearing surfaces of the lid and frame machined or ground so that there will be no variation from a circular, straight edge, of the dimensions corresponding to the lid bearing surface. The diameter of the lid shall be such as to fit the frame without wedging.

ADD:

751-2.8 STEEL REINFORCEMENT

Concrete reinforcing shall consist of deformed bars of either structural, intermediate, or hard grade billet steel meeting AASHTO M31; deformed bars of rail steel meeting AASHTO M42; or welded wire fabric meeting AASHTO M-55. To qualify as deformed, bars shall conform to the requirements of AASHTO M-137.

CONSTRUCTION METHODS

751-3.2 BRICK STRUCTURES

DELETE: Entire Section.

751-3.3 CONCRETE STRUCTURES

ADD: After the first sentence:

Foundation materials shall conform to Section 701-3.3 constructed to the dimensions and thicknesses shown in the plans.

751-3.5 CORRUGATED METAL STRUCTURES

DELETE: Entire Section.

751-3.9 BACKFILLING

DELETE: Paragraph (a):

ADD: Backfill material shall be an approved IDOT Division of Highways Gradation CA-10 conforming to the material requirements of Item 209.

METHOD OF MEASUREMENT

751-4.1 CHANGE: Text to include:

- structure adjustments

BASIS OF PAYMENT

751-5.1 CHANGE: Text to include:

- structure adjustments

Payment will be made under:

- Item AR751410 -- Inlet -- per each.
- Item AR751411 -- Inlet – Type A -- per each.
- Item AR751412 -- Inlet – Type B -- per each.
- Item AR751415 -- Inlet – Special -- per each.
- Item AR751530 -- Manhole -- per each.
- Item AR751540 -- Manhole 4' -- per each.
- Item AR751550 -- Manhole 5' -- per each.
- Item AR751560 -- Manhole 6' -- per each.
- Item AR751567 -- Manhole 7' -- per each.
- Item AR751568 -- Manhole 8' -- per each.
- Item AR751570 -- Manhole - Special -- per each.
- Item AR751940 -- Adjust Inlet -- per each.
- Item AR751943 -- Adjust Manhole -- per each.
- Item AR751949 -- Adjust Inspection Hole -- per each.
- Item AR751952 -- Adjust Special Structure -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 752 CONCRETE CULVERTS, HEADWALLS, & MISC. DRAINAGE
STRUCTURES

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 752 "Concrete Culverts, Headwalls, & Misc. Drainage Structures" is modified as outlined below:

DESCRIPTION

752-5.1 ADD: This item shall consist of:

- precast reinforced concrete end section
- grating for the precast reinforced concrete end section
- special structures

To the lines and grades as shown on the plans or as required by the Engineer.

BASIS OF PAYMENT

752-5.1 ADD: Payment will be made under:

Item AR752412 -- Precast Reinforced Conc. Fes 12" -- per each.
 Item AR752415 -- Precast Reinforced Conc. Fes 15" -- per each.
 Item AR752418 -- Precast Reinforced Conc. Fes 18" -- per each.
 Item AR752424 -- Precast Reinforced Conc. Fes 24" -- per each.
 Item AR752430 -- Precast Reinforced Conc. Fes 30" -- per each.
 Item AR752436 -- Precast Reinforced Conc. Fes 36" -- per each.
 Item AR752442 -- Precast Reinforced Conc. Fes 42" -- per each.
 Item AR752448 -- Precast Reinforced Conc. Fes 48" -- per each.
 Item AR752512 -- Grating for Conc. Fes 12" -- per each.
 Item AR752515 -- Grating for Conc. Fes 15" -- per each.
 Item AR752518 -- Grating for Conc. Fes 18" -- per each.
 Item AR752524 -- Grating for Conc. Fes 24" -- per each.
 Item AR752530 -- Grating for Conc. Fes 30" -- per each.
 Item AR752536 -- Grating for Conc. Fes 36" -- per each.
 Item AR752542 -- Grating for Conc. Fes 42" -- per each.
 Item AR752548 -- Grating for Conc. Fes 48" -- per each.
 Item AR752850 -- Special Structure -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 754 CONCRETE GUTTERS, DITCHES AND FLUMES

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 754 "Concrete Gutters, Ditches And Flumes" is modified as outlined below:

DESCRIPTION

754-1.1 REVISE: To read as follows.

ADD: This item shall conform to the detail or IDOT standard shown in the plans and shall consist of portland cement concrete curb and/or gutter and/or combination curb and gutter constructed in accordance with these specifications at the specified locations in conformance with the details dimensions, lines, and grades as shown on the plans or as required by the Engineer.

This item shall also consist of removal of concrete curb and/or gutter and/or combination curb and gutter in accordance with these specifications at the specified locations in conformance with the details dimensions, lines, and grades as shown on the plans or as required by the Engineer.

MATERIALS

754-2.2 JOINTS

ADD: Joint filler

754-2.5 GRANULAR BEDDING

ADD: A 4" granular bedding course shall be constructed and mechanically compacted under all proposed curbs and gutters. Granular Bedding shall be IDOT CA-6 in accordance with Item 208.

CONSTRUCTION METHODS

ADD:

754-3.5 REMOVALS The existing curb and/or gutter and/or combination curb and gutter shall be sawcut at the limits of removal. If adjacent pavement or structures are to remain in place the Contractor shall provide sawcuts along

the pavement or structures to remain. The curb and/or gutter and/or combination curb and gutter shall be completely removed and disposed of by the Contractor off of airport property.

BASIS OF PAYMENT

754-5.1 DELETE: Entire section.

ADD: Payment will be made at the contract unit price per linear foot for concrete curb and/or gutter and/or combination curb and gutter completed and accepted in accordance with the plans and specifications.

Payment will be made at the contract unit price per linear foot for removal of concrete curb and/or gutter and/or combination curb and gutter completed and accepted in accordance with the plans and specifications.

These prices shall be full compensation for furnishing all materials, and for all preparation, excavation, granular bedding and compaction and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete the item. Granular bedding for curb and gutters shall not be measured separately but shall be considered incidental to the proposed curb and gutter.

Payment will be made under:

- Item AR754210 -- Concrete Curb -- per linear foot.
- Item AR754212 -- Concrete Curb Type B -- per linear foot.
- Item AR754214 -- Concrete Curb Type M -- per linear foot.
- Item AR754310 -- Concrete Gutter -- per linear foot.
- Item AR754312 -- Concrete Gutter, Type A -- per linear foot.
- Item AR754314 -- Concrete Gutter, Type B -- per linear foot.
- Item AR754410 -- Comb Concrete Curb & Gutter -- per linear foot.
- Item AR754412 -- Concrete Curb & Gutter (Type B6.24) -- per linear foot.
- Item AR754900 -- Remove Concrete Curb -- per linear foot.
- Item AR754902 -- Remove Concrete Curb & Gutter -- per linear foot.
- Item AR754904 -- Remove Comb Curb & Gutter -- per linear foot.

State of Illinois
 Department of Transportation
 Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
 ITEM 901 SEEDING

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 901 “Seeding” is modified as outlined below:

DESCRIPTION

901-1.1 ADD: This item shall consist of seeding all areas disturbed by the Contractor's operations. Areas to be seeded which have slopes greater than or equal to 4:1 shall be seeded with seed mix No. III. All other areas shall be seeded with seed mix No. IA or IB. Seeding shall immediately follow clearing and grubbing operations outside of the grading limits to minimize erosion.

MATERIALS

901-2.1 SEED

ADD: The seed mixtures shall be as follows, with the specific mix to be according to the seeding plan, depending on the date, weather and site conditions encountered at the time of application.

Mix No.	Seeds	Lbs./Acre	Season to Use
1A	Kentucky Bluegrass	50	Spring (March 15 to May 15)
	Perennial Ryegrass	20	
	Tall Fescue	15	
	Smooth Brome	15	
	Spring Oats	32	
1B	Kentucky Bluegrass	50	Fall (August 1 to September 10)
	Perennial Ryegrass	20	
	TAll Fescue	15	
	Wheat or Cereal Rye	20	
	Smooth Brome	15	
III	Kentucky 31 or Alta Fescue	40	
	Perennial Ryegrass	20	
	Alsike Clover**	5	
	Birdsfoot Trefoil**	10	
	Little Bluestem	5	
	Side Oats Grama	10	

** Legumes - Inoculation required

Season mixes may be planted at any time between March 1 and June 30 for Spring mix and July 1 through December 15 for Fall mixes provided that the ground is not frozen or in any way detrimental to the seed.

All legumes (clover, vetch, birdsfoot trefoil, lespedeza and alfalfa) shall be inoculated with the proper bacteria in the amounts and manner recommended by the manufacturer of the inoculant before sowing or being mixed with other seeds for sowing. The inoculant shall be furnished by the Contractor and shall be approved by the Engineer. The seed shall be sown as soon as possible after inoculation and seed that has been standing more than 24 hours after inoculation shall be reinoculated before sowing. If legumes are applied by hydro seeder, 3 times the normal amount of inoculant shall be used. The Contractor shall furnish the inoculant and the cost of furnishing same shall be included in the contract unit price per acre for seeding of the class specified.

901-2.2 LIME

ADD: Agricultural lime shall be applied at 2 ton per acre.

901-2.3 FERTILIZER

ADD: Fertilizer, shall be required containing the following percentages: 18% total nitrogen, 24% available phosphoric acid, and 6% water-soluble potash. They shall be applied at a rate of 420 pounds per acre and incorporated to a minimum depth of 3 inches.

CONSTRUCTION METHODS

901-3.1 ADVANCE PREPARATION AND CLEANUP

ADD: Soil moisture shall exist throughout the zone from one inch to at least five inches below the surface at the time of planting. The required moisture content of the soil may be estimated and judged closely by the hand-squeeze test. The soil should readily form a tight cast when squeezed in the hand. The cast should break into two pieces without crumbling and without leaving excess water on the hand after casting.

In seeding mix No. III areas, the slopes shall be ripped parallel to the contours prior to seeding operations.

901-3.4 MAINTENANCE OF SEEDED AREAS

DELETE: Second paragraph.

ADD: The Contractor shall be required to establish a good stand of grass of uniform color and density to the satisfaction of the Engineer and Owner. The turf shall not contain ruts, gullies or undulations.

METHOD OF MEASUREMENT

901-4.1 ADD: When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

The quantity of seeding to be paid for shall be the number of acres seeded and fertilized as specified, measured on the ground surface, completed and accepted.

Only those areas disturbed to complete the work shown in the plans shall be seeded unless directed otherwise by the Engineer. All other areas requiring repair due to the Contractor's operations shall be seeded with the cost to be borne by the Contractor.

The quantity of water utilized for seed bed preparation, maintenance of the seeded areas and water used as a carrier for seed in hydraulic seeding operations shall be considered incidental to seeding and will not be measured for payment.

BASIS OF PAYMENT

901-5.1

Payment will be made under:

Item AR901510 -- Seeding -- per acre.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 904 SODDING

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 904 "Sodding" is modified as outlined below:

METHOD OF MEASUREMENT

904-4.1 ADD: When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

Only those areas designated in the plans shall be sodded, unless directed otherwise by the Engineer. All other areas requiring repair due to the Contractor's operations shall be sodded with the cost to be borne by the Contractor.

The quantity of water utilized for sod bed preparation and maintenance of the sodded areas shall be considered incidental to sodding and will not be measured for payment.

Areas of sodding not showing a uniform stand of grass in density and color shall not be approved for payment. Such areas shall be resodded to the Owner's satisfaction at the Contractor's cost.

BASIS OF PAYMENT

904-5.1

Payment will be made under:

Item AR904510 -- Sodding -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 905 TOPSOILING

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 905 "Topsoiling" is modified as outlined below:

DESCRIPTION

905-1.1 ADD: Topsoil shall be stripped from cut areas and below proposed pavements and stockpiled outside of the grading limits. Topsoil shall be utilized in shoulders adjacent to the proposed pavements. In addition, the surface of all disturbed areas shall be covered with a layer of topsoil, as needed, to facilitate drainage and the growth of turf.

No separate payment shall be made for stockpiling or excavation from the stockpile. Costs associated with this work shall be considered incidental to Item 152.

CONSTRUCTION METHODS

905-3.4 PLACING TOPSOIL

Rutted or damaged areas due to construction and other areas graded as a part of this contract shall have topsoil spread as required to facilitate drainage and turfing.

METHOD OF MEASUREMENT

905-4.1 DELETE: This Section.

905-4.2 DELETE: This Section.

BASIS OF PAYMENT

905-5.1, 905-5.2

DELETE: These Sections.

ADD:

905-5.1 No individual payment for topsoil material shall be made. Payment for topsoil will be made at the contract unit price per cubic yard for Item AR152410 - Unclassified Excavation or at the contract unit price per square yard for Item AR152480 Shoulder Adjustment.

State of Illinois
 Department of Transportation
 Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
 ITEM 908 MULCHING

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 908 “Mulching” is modified as outlined below:

DESCRIPTION

908-1.1 ADD: Mulch shall be provided on all seeded areas.

MATERIALS

908-2.1 MULCH MATERIAL

DELETE: First sentence.

ADD: Material used for mulching shall be (a) hay or (b) straw, except as noted. Manufactured hydraulic mulch shall be used on slopes exceeding 3:1.

Hydraulic Mulch: Hydraulic mulch shall be virgin or recycled wood cellulose or paper fibers containing no growth or germination inhibiting factors. Hydraulic mulch shall disperse evenly and rapidly and remain in slurry when agitated with water. The slurry shall be green in color to allow visual metering of its application and, when sprayed uniformly on the surface applied to, shall form an absorbent cover allowing percolation of water to the underlying surface. Hydraulic mulch shall be packaged in moisture resistant packages or bags with the net quantity of the packaged material plainly shown on each such package. The wood cellulose or paper fibers shall not be water soluble and shall comply with the following properties when tested in accordance with the procedures outlined in the latest revision of Federal Specification O-P-166. The recycled wood cellulose or paper fibers shall be relatively free of glossy papers.

Moisture content, as received basis, percent by weight, maximum	15
Organic matter, wood fiber, oven dried basis, percent by weight, minimum	95
pH	4.3 - 8.5
Water holding capacity, oven dried basis, percent by weight, minimum	400

CONSTRUCTION METHODS

908-3.1 ADD: Within 24 hours from the time seeding has been performed, the seeded or planted area shall be given a covering of mulch by the following method. On slopes steeper than 3:1, mulch shall be applied the same day as seeded or planted. Mulch shall be applied uniformly at the rate specified. The application method shall consist of hand or machine application of hay or straw mulch. The mulch shall be loose enough to permit air to circulate but compact enough to reduce erosion. If baled mulch material is used, care shall be taken that the material is in a loosened condition and contains no lumps or knots of compacted material.

At the Contractor's option, or where required, "Hydraulic Mulch" method may be utilized. This method shall consist of machine application of wood or paper fiber hydraulic mulch at the specified rate using an approved hydraulic seeder. The hydraulic mulch shall be applied as a slurry of 2,000 pounds of mulch and not less than 2,000 gallons of water per acre. The hydraulic mulch slurry shall be agitated a minimum of 5 minutes before application and shall be in continuous agitation during application. The seeding will not be applied concurrently with this operation. The mulch shall be loose enough to permit air to circulate, but compact enough to reduce erosion.

Following the mulching operation, every precaution shall be taken to prohibit foot or vehicular traffic, or the movement of equipment over the mulched area. At any location where mulching has been displaced by any Contractor's equipment or personnel, the seeding or other work damaged as a result of that displacement shall immediately be replaced and the mulch covering replaced, at the Contractor's expense, in a manner satisfactory to the Engineer.

It shall be the Contractor's responsibility to make certain that the rate of mulch application is maintained constant throughout the seeding operations.

908-3.2 SECURING MULCH

ADD: The hay or straw shall be applied in accordance with all of the above requirements except a mulch stabilizer shall be used to anchor mulch into the soil by means of full blades or disks. These blades or disks shall be without camber, be approximately 20 inches in diameter. The disks shall be notched and shall be spaced at approximately 3 inch intervals and shall be equipped with scrapers. The stabilizer shall weigh approximately 1,000 pounds and shall have a working width not to exceed 72 inches and shall be equipped with a ballast compartment, so that when directed, weight can be increased. The Contractor shall notify the Resident Engineer of his proposed method of securing for his approval prior to performing the work.

METHOD OF MEASUREMENT

908-4.1 When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

CHANGE: Square yards to acres.

ADD: Only those areas measured for seeding shall be mulched unless otherwise directed by the Engineer. All other areas requiring repair due to the Contractor's operations shall be mulched with the cost to be borne by the Contractor.

BASIS OF PAYMENT

908-5.1 CHANGE: Square yards to acres.

Payment will be made under:

Item AR908510 -- Mulching -- per acre.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 101 INSTALLATION OF AIRPORT ROTATING BEACONS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 101 "Installation Of Airport Rotating Beacons" is modified as outlined below:

DESCRIPTION

101-1.1

ADD: This item of work shall consist of furnishing and installing a rotating beacon at the location shown in the plans or relocating the existing beacon as shown in the plans. All necessary electrical connections and work required to install the proposed or relocated rotating beacon to function properly will be considered part of this work item and no additional compensation will be permitted. This includes all vault work and installation of obstruction lighting required. Two FAA approved L-810 obstruction lights shall be mounted on the proposed beacon with a photocell and all necessary electrical components to make it complete and operational to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

101-2.2 BEACON.

ADD: The proposed beacon shall be of the type and size shown in the plans.

CONSTRUCTION METHODS

101-3.6 BEACON MOUNTING PLATFORM.

ADD: The proposed beacon will be mounted to the top of the beacon tower in accordance with the manufacturer's recommendations. The Contractor will make any necessary modifications to the mounting assembly in order to bolt the proposed beacon to the beacon tower.

101-3.7 WIRING.

ADD: For beacon replacement, all cables associated with the existing rotating beacon that are in conflict with the installation of the proposed

beacon shall be removed by the Contractor and disposed of off airport property. Existing underground cables that do not conflict shall be abandoned in place.

BASIS OF PAYMENT

101-5.1 ADD: Payment shall be made at the contract per each price for a completed and accepted installation. This price shall be full compensation for furnishing all materials and for preparation, removals, obstruction lights and beacon wiring, conduit, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item including the removal of the existing beacon where shown in the plans. Payment will be made under

Item AR101510 -- Airport Rotating Beacon -- per each.

Item AR101920 -- Beacon Replacement -- per each.

Item AR101960 -- Beacon Relocation -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 103 INSTALLATION OF AIRPORT BEACON TOWERS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 103 Installation Of Airport Beacon Towers is modified as outlined below:

MATERIALS

103-2.2 TOWER

REVISE: This section to read:

The Steel Tower shall be 51' in height and shall conform to the details and requirements shown on the plans.

Foundations and installation shall be per manufacturer's recommendations. The contractor shall furnish and install conduit, cable, disconnect switch and any necessary items to make a complete and operational system.

BASIS OF PAYMENT

Payment will be made under:

- Item AR103551-- Structural Steel Tower 51' -- per each.
- Item AR103651-- Tubular Steel Tower – 51' -- per each.
- Item AR103900 -- Remove Beacon Tower -- per each.
- Item AR103960 -- Relocate Beacon Tower -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 107 INSTALLATION OF AIRPORT 8-FOOT & 12-FOOT WIND CONES

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 107 "Installation Of Airport 8-Foot & 12-Foot Wind Cones" is modified as outlined below:

RESERVED

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 108 INSTALLATION OF UNDERGROUND CABLE FOR AIRPORTS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 108 "Installation Of Underground Cable For Airports" is modified as outlined below:

DESCRIPTION

108-1.1 ADD: This item of work shall include the following:

Installation of direct buried cable and cable in unit duct and conduit as shown on the plans. The Contractor has the option to either trench or plow the proposed cable in unit-duct into place. All direct buried cable not in unit duct will be trenched into place.

All installations shall be at the locations shown on the plans and in accordance with these specifications. In areas where there is a congestion of buried cable, the Contractor will be required to trench the proposed cable into place. When crossing existing circuits, the Contractor will be required to hand dig the trenches for the proposed cable.

The hand digging and trenching or plowing of this cable will be considered incidental to the contract unit price of the proposed cable and no additional compensation will be allowed.

The Contractor shall label all airfield lighting cables in ducts, manholes and the vault as directed by the Resident Engineer. All costs of labeling shall be considered incidental to the contract unit price for the associated item.

EQUIPMENT AND MATERIALS

108-2.1 GENERAL

ADD:

(c) Except as specified otherwise, all new equipment shall be provided by the Contractor and shall be tested for specification conformance as part of the Aviation Lighting Equipment Certification Program. Currently, these tests are performed by ETL Testing Laboratories. Certification of conformance as tested by ETL Testing Laboratories shall be provided by the manufacturer for all items submitted for approval. Equipment that has

not been tested by ETL Testing Laboratories but is listed in Advisory Circular 150/5345-1 (latest edition) may be submitted for approval, provided that the manufacturer provides certification that the submitted equipment continues to meet FAA standards on which approval was originally made and that FAA standards for the equipment have not changed since the release of 150/5345-1 (latest Edition).

- (d) FAA/ETL approval of airport lighting equipment only means that the test data satisfied the applicable specification requirements. This does not insure that the approved equipment will satisfactorily operate when connected either power and/or control, to other approved airport lighting equipment or "off the shelf" equipment not requiring FAA approval.
- (e) The Contractor shall ascertain that all lighting system components furnished by him (including FAA approved equipment) are compatible in all respects with each other and the remainder of the new/existing system. Any non-compatible components furnished by the Contractor shall be replaced by him at no additional cost to the airport sponsor with a similar unit, approved by the Engineer (different model or different manufacturer) that is compatible with the remainder of the airport lighting system.

108-2.2 CABLE

DELETE: Paragraphs (a) and (b).

ADD: All series circuit cable shall be L-824, 1/C, No. 8, 5000 V, Type C in unit-duct of the size shown on the plans.

Low voltage power cable shall be L-824, 1/C, 600V, Type C in unit duct of the size shown on the plans.

Proposed cable and unit duct shall be factory assembled and delivered to the site on reels.

108-2.3 BARE COPPER WIRE (COUNTERPOISE)

DELETE: This Section.

108-2.4 CABLE CONNECTIONS

DELETE: Paragraphs (b), and (e).

ADD to First Paragraph: Only L-823 connectors shall be used for all L-824 cable airfield lighting circuit connections.

The Contractor will use a cable stripper/penciller whenever cable connections are made. All breaks in the unit duct will be sealed by shrink kits.

ADD:

108-2.6 UNIT-DUCT

Where indicated on the Plans, unit-duct shall be as described under this item. The duct shall comply with NEMA Standards Publication No. TC7-1990, Part 4, ASTM D3485, and ASTM D D1248, with additions, options, and exceptions as detailed herein. The duct shall be annealed during the extrusion process. The duct shall be manufactured from black, virgin, high density polyethylene resin designated as Type III, Grade P34, Class C, Category 5 material in accordance with ASTM D 1248.

Standard sizes of smooth wall polyethylene duct shall conform to the dimensional requirements specified below:

Unit duct shall be $\frac{3}{4}$ " diameter unless otherwise shown in the plans.

Dimensional measurements shall be performed on samples removed from each complete length of finished duct. The manufacturer shall have the capability to manufacture a composite wire/cable-in-duct system, wherein the wire and cables are placed in the polyethylene duct without sticking during the extrusion process. The open ends of each length of reeled flexible duct shall be sealed by plastic caps to prevent the entrance of dirt and water. The duct shall have a durable identification which shows the manufacturer's name and/or trademark, all at intervals not to exceed ten (10) feet.

The manufacturer shall furnish copies of certified test reports on duct. The unit-duct shall be Cablecon, as manufactured by Integral Corp., or equal.

ADD:

108-2.7 HEAT SHRINK TUBING

Heat shrink tubing for FAA Type L-823 plug and receptacle cable connections shall be Raychem APL 1300/400-16, Sigmaform Corp. Series APL-823A or equivalent. Complete kit shall be used and shall be capable of being stripped off easily for re-entry.

Heat shrink tubing for 5KV, L-824 Airfield in-line splices shall be Raychem HVS-501 or equivalent.

Heat shrink tubing for 600V, general power distribution in-line splice shall be Raychem WCSM or equivalent.

Heat shrink tubing for cables other than as specified above shall be as required by Engineer.

ADD:

108-2.8 CABLE PLOWING EQUIPMENT

At the Contractor's option the cable in unit-duct may be installed in trench or using cable plowing equipment.

The cable plowing equipment shall be of the vibratory type. It shall vibrate at a rate of at least 1200 cycles per minute. The vibrating unit shall not be rigidly mounted on the tractor. It shall be connected to the tractor for towing, in such a manner that the tractor will not dampen the vibrations.

The plow blade shall be of sufficient length to facilitate installation of unit-duct at the specified depth. The shoe throat shall be sized for the unit-duct size. Cable way and cable guides shall be smooth, free of obstructions and sharp edges and shall not cause bending of the unit-duct at shorter than 3-inch radius. It also shall not cause excessive cable strain which may damage cable insulation or stretch the conductor.

Where several conducts are installed in a single operation, the plow shall be equipped with separate feeds, one for each conductor, to provide the specified separation.

ADD:

108-2.9 LINE MARKING TAPE

The line marking tape shall be approximately 5 mils thick constructed of aluminum foil encased in an impervious mylar plastic coating. The minimum tensile strength determined in accordance with ASTM D882 is 1600 per square inch. The tape shall contain sufficient metal mass to provide detectability at depths up to 3 feet with a radio type metal locator. Tape shall be acid, alkali and corrosion resistant. Color shall be "RED" corresponding to the standard color for electric lines.

The tape shall be "Type III Super Tuff" detectable underground utility line marking tape as manufactured by LINEGUARD, Inc. of Wheaton, Illinois or an approved equal.

CONSTRUCTION METHODS

108-3.1 GENERAL

REVISE: First sentence of the second paragraph to read as follows:
Cable connections between fixtures will be permitted only at the fixture locations for connecting the underground cable to the individual fixtures.

ADD: Cable shall be continuous between lights. Any repairs necessary after backfilling shall be done at the Contractor's expense and shall consist of replacing the entire length of damaged cable between lights. All cable shall be in unit-duct unless shown as otherwise in the plans

All lighting circuits are considered critical. It is, therefore, imperative that the Contractor carefully review the plans showing electrical layout.

If the Contractor desires to lay cable on a line other than that shown on the plans, he shall obtain the approval of the Engineer before doing so, and any additional cable required to do so will not be paid for unless being completely necessary to make a more proper connection or more convenient location.

The Contractor may be allowed to provide a single unit-duct with 2-each 1/C #8 5KV cable for the lighting series circuit homerun.

The location of existing cables are taken from available record maps and it will be necessary for the Contractor to make field investigations to determine the exact locations of underground cable and conduits at critical points. ANY EXISTING CABLES CUT AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IN ACCORDANCE WITH PARAGRAPHS 108-2.4 and 108-3.8, COST TO BE BORNE BY THE CONTRACTOR.

108-3.2 INSTALLATION IN DUCT OR CONDUIT

ADD: The following to this section:

The cable in unit-duct shall be delivered to the jobsite pre-assembled on reels.

108-3.3 TRENCHING

Delete the last sentence of the second paragraph.

ADD: Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 24 inches below finished grade, except as follows:

- (a) When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches unless otherwise specified.
- (b) Minimum cable depth when crossing under a railroad track shall be 42 inches unless otherwise specified.

ADD: All cable in unit-duct may be installed using the plowing-in method or direct burial in trench, (Refer to Item 108-3.11) except at critical locations where required to protect existing cables or to facilitate construction. Cable plowing shall be done at a minimum depth of 18" below finished grade.

Trenching shall be at no additional cost to the Contract.

108-3.4 INSTALLATION IN TRENCHES

CHANGE: The first sentence to read as follows:

Except for installation of cable (or cables) in unit-duct, the Contractor shall not use a cable plow for installing cable.

ADD: The following to this section:

At locations, such as in an existing duct or wireway, or near an existing light location, where existing cable to be replaced might obstruct or interfere with efficient operation of the electrical systems, it shall be removed and disposed of by the Contractor. The cost of removing and disposing of this existing cable shall be considered as incidental to the contract unit price per linear foot for underground cable installed in trench or duct, and no additional compensation will be allowed.

108-3.5 BACKFILLING

ADD: Line marking tape shall be installed during the backfill process at a minimum depth of 4" and a maximum depth of 8". Installation methods shall be to the satisfaction of the Engineer.

108-3.8 SPLICING

DELETE: Paragraphs (b) and (e).

ADD: Splices will be allowed in new circuits only at fixtures as detailed on plans.

108-3.9 BARE COUNTERPOISE WIRE INSTALLATION AND GROUNDING FOR LIGHTNING PROTECTION

DELETE: This Section.

108-3.10 TESTING

ADD: All testing shall be performed in the presence of the Engineer. All cables found to be defective due to installation methods shall be replaced by the Contractor at his expense.

All existing circuits to which additions or deletions are to be made shall be meggered BEFORE any work is performed. Megger readings taken after completion of the work shall be, as a minimum, equal to the previous reading. Should the reading be deficient, the Contractor shall locate within his work area, the source of the deficiency and correct it at his expense.

The remaining existing field circuits within the working limits of this contract which are not scheduled to be added or deleted from shall also be meggered BEFORE any work is performed in the presence of the Engineer. Any subsequent damage to these existing circuits shall be immediately repaired at no cost to the contract such that megger readings taken after completion of

the repair shall be, as a minimum, equal to the reading taken before the work began.

The new cable, after installation and after connection of all series circuit isolation transformers, but before connection to power source (constant current regulators, power transformers, disconnect switches, etc.) and/or connections to load other than isolation transformers (PAPI, etc.), shall be tested in the following manner:

- (a) The conductor resistance shall be measured by an ohmmeter and shall be within $\pm 20\%$ of the calculated value for the size and length of the conductor.
- (b) Each test shall last for a minimum of one minute after instrument readings have been stabilized. The minimum acceptable insulation resistance value shall be 50 megohms.
- (c) When unacceptable readings are obtained, the Contractor shall locate the fault(s) and correct them.
- (d) The test equipment and power to operate it shall be furnished and operated by the Contractor at no additional cost. The equipment shall be approved by the Engineer before testing is commenced. All tests shall be witnessed by the Engineer.

ADD:

108-3.11 PLOWING-IN OF CABLE IN UNIT-DUCT

NOTICE: Plowing-in of unit-duct does not relieve the Contractor of responsibility for repairing damage to existing cables cut as a result of the Contractor's operations, as described in Paragraph 108-3.1. Extreme care must be taken to locate all existing circuits in the working limits of the plowing operations before commencing the operation. The Contractor shall have the option of trenching-in cables as described in Paragraph 108-3.3, 108-3.4, 108-3.5, and 108-3.6 in lieu of plowing-in any sections so noted on the plans - at no additional cost or time to the contract.

If the Contractor elects to plow the cable in unit-duct into place, his plowing operation must conform to the following requirements:

The forward moving speed of the plow shall be between 15 and 40 feet per minute. The plow shall be wide enough to freely allow the unit-duct to pass through it but not exceed the overall width of two inches.

The unit-duct shall be inserted into the plow in a manner that will not cause the unit-duct to bind, pull or break. The unit-duct shall be installed so that it is possible to withdraw a cable and pull in a new one. Sweeping long radius bends shall be used. Any run with a kink or short radius bend will be rejected. The holes for the transformer bases or at locations of cable termination shall be dug before the plowing operation is commenced. A

method approved by the Engineer shall be used to prevent the walls of the holes from collapsing due to tractor and plow wheels.

The unit-duct may be unreeled along the proposed cable route before plowing or the unit-duct reels may be mounted on the tractor. In the latter case unreeling of the unit-duct shall not cause excessive tension on the cable.

After the tractor and the plow is positioned at the beginning of the run, sufficient unit-duct slack shall be pulled through the throats. Then the plow shall be lowered into the hole and the unit-duct shall be hand held for the start of plowing.

At each equipment hole the plow shall be stopped (movement and vibration), raised and the required amount of slack shall be hand pulled. Care shall be taken during the operation that the unit-duct, at the entrance into the equipment hole, shall not be pulled from the specified depth. Plowing shall be continued by lowering the plow, starting it and holding the unit-duct by hand until it is firmly held by the ground.

The plow shall not be backed onto the unit-duct.

When an underground obstruction is encountered, the plow shall be lifted out of the ground. The obstruction shall be removed by hand digging. An opening shall be hand dug around the unit-duct down to the depth of the unit-duct and large enough to lower the plow. then the plow shall be lowered into the opening. While this is being done the unit-duct shall be pulled back into the throat by hand to prevent kinks or sharp bends. In no case shall the unit-duct be bent sharper than 3 inch radius, or be subjected to excessive tension.

After installation of unit-duct by plowing, the disturbed earth at the surface shall be leveled and, if necessary, compacted by a device approved by the Engineer.

Ends of cable shall be taped immediately after cutting to prevent moisture from entering the cable. Where the cable is not expected to be connected for at least 72 hours, the tape shall also be varnished.

To identify routing of the unit-duct, immediately after plowing, stakes shall be installed every 500 feet along straight runs and at each curve. Later these stakes shall be replaced by regular concrete cable markers.

Before cable plowing is commenced, equipment to be used shall be inspected by the Engineer and approved. Before approving, the Engineer may require demonstration of the equipment at the installation site and location selected by the Engineer and by using actual unit-duct. The test run shall consist of at least one starting hole, one intermediate hole (equipment location) and one terminating hole and shall be 100 feet long as minimum. The test cable shall not be reused. The cost for the test run shall be included into the item for underground cable.

Plow operators shall be experienced and qualified by schooling and/or by sufficient on-the-job training under an experienced operator. Proof of such qualification shall be required from the Contractor.

ADD:

108-3.12 LOCATING OF EXISTING CABLES

Contractor shall locate and mark all existing cables within ten (10) feet of proposed excavating, plowing/trenching area. Any cables found interfering with proposed excavation or cable plowing/trenching shall be hand dug and exposed. Any damaged cables shall be immediately repaired to the satisfaction of the Engineer at the Contractor's expense. The Resident Engineer and Owner shall be notified immediately if any cables are damaged.

It should be noted that all FAA control and communications cables shall be located by the FAA. All utility cables shall be located by the utility. The contact person shall be JULIE (Joint Utility Locating Information for Excavators).

Payment for locating and marking underground cable will not be paid for separately but shall be considered incidental to the plowing/trenching of unit-duct.

ADD:

108-3.13 TERMINATIONS AND CONNECTIONS

Unit-duct shall be terminated on the inside of light bases and shall be sealed in a manner which will prevent dirt or water from entering the duct.

All L-823 connections at light fixtures shall be taped with one layer of rubber tape and one layer of plastic one-half, lapped, extending at least 1-1/2" each side of the joint. Heat shrinkable tubing with interior adhesive shall be applied at all cable connections. The heat shrinkable tubing will be as manufactured by 3M, Scotch, or equal and applied as recommended by the manufacturer.

In line connections for existing cables cut during construction shall be repaired with the cast splice kit. The Contractor shall have a minimum of two (2) splice kits on the jobsite at all times for emergency repairs. Splice markers shall be installed over each splice in cables not to be abandoned. Cast splice kits shall be as specified in Paragraph (a) of Item 108-2.4.

No splices will be allowed in the new cable. Cable shall be continuous from light to light. Any repairs necessary after backfilling the trenches shall be done at the Contractor's expense and shall consist of replacing the entire length of damaged cable between fixtures.

METHOD OF MEASUREMENT

108-4.1 DELETE: This Section.

ADD: The footage of cable and cable in unit-duct to be paid for shall be the number of linear feet installed by the plowing-in method (for cable in unit duct only), in common trench, or installed in existing or proposed duct banks, measured in place, completed, ready for operation, and accepted as satisfactory. No additional measurement will be made for multiple conductors in a common unit-duct. No extra quantity will be allotted for any vertical distances or the required cable slack, as stated under Item 108-3.4.

No measurement for payment will be made for the plowing in, trenching, or installing in existing or proposed duct banks for cable or cable in unit duct. The cost of plowing-in or installation in trenches or duct banks, and all connections and splices shall be included in the unit price bid for the measured cable or cable in unit duct in place.

The costs associated with the above cables which are not measured for payment, including cable slack, shall be considered incidental to the unit prices for the light unit they are associated with.

108-4.2 The footage of line marking tape installed shall be considered incidental to the work and shall not be measured separately.BASIS OF PAYMENT108-5.1 REVISE: The first section to read:

1. The cable and cable in unit duct measured under Item 108-4.1 shall be paid for under this item.

These prices shall be full compensation for furnishing all materials and for all preparation and installation of these materials, plowing, backfilling and compacting trenches, all connections, line marking tape and installation, and for all labor, equipment, tools, and incidentals necessary to complete these items.

2. The line marking tape installed shall be considered incidental to the work and shall not be paid for separately.

Payment will be made under:

Item AR108108 -- 1/C #8 5KV UG Cable -- per linear foot.
 Item AR108158 -- 1/C #8 5KV UG Cable in UD -- per linear foot.
 Item AR108208 -- 2/C #8 5KV UG Cable -- per linear foot.
 Item AR108258 -- 2/C #8 5KV UG Cable in UD -- per linear foot.
 Item AR108408 -- 1/C #8 600 V UG Cable -- per linear foot.
 Item AR108458 -- 1/C #8 600 V UG Cable in UD -- per linear foot.
 Item AR108508 -- 2/C #8 600 V UG Cable -- per linear foot.

Item AR108558 -- 2/C #8 600 V UG Cable in UD -- per linear foot.
Item AR108758 -- 1/C #8 Ground -- per linear foot.
Item AR108800 -- Control Cable -- per linear foot.
Item AR108819 -- 19 Pair Control Cable -- per linear foot.
Item AR108966 -- Relocate Cable -- per linear foot.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 109 INSTALLATION OF AIRPORT TRANSFORMER VAULT & VAULT
EQUIPMENT

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 109 "Installation Of Airport Transformer Vault & Vault Equipment" is modified as outlined below:

DESCRIPTION

109-1.1 DELETE: This Section.

ADD: This work shall include all conduits and wireway required for cabling used in connection of new or relocated equipment at the locations and to the dimensions shown on the plans or approved by the Engineer.

Work shall include any painting of equipment and conduit, the marking and labeling of equipment and the labeling or tagging of wires, testing of the installation, and the furnishing of all incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the Engineer.

This item shall also consist of furnishing and installing vault equipment and miscellaneous power and control wiring as required for operation, complete and ready to operate.

EQUIPMENT AND MATERIALS

109-2.1 GENERAL

REVISE: Paragraph (a) to read as follows:

- a. Airport lighting equipment and materials covered by FAA specifications shall have prior approval of the Federal Aviation Administration, Airport Service, Washington, D.C. 20591, and shall be listed in the latest Advisory Circular 150/5345-1, Approved Airport Lighting Equipment.

FAA approval of airport lighting equipment and subsequent inclusion in Advisory Circular 150/5345-1, "Approved Airport Equipment," only means that the test data satisfied the applicable specification requirements. This does not insure that the approved equipment will satisfactorily operate when interconnected to other approved airport lighting equipment or "off

the shelf" equipment not requiring FAA approval in a power and/or control configuration.

The Contractor shall ascertain that all lighting system components furnished by him (including FAA approved equipment) are compatible in all respects with each other and the remainder of the new and/or existing systems. Any incompatible components furnished by the Contractor shall be replaced by him at no additional cost to the Airport Sponsor with a similar unit, approved by the Engineer (different model or different manufacturer) that is compatible with the remainder of the airport lighting system.

Equipment and materials shall be as specified in the Contract Special Provisions and as shown on the plans.

CONSTRUCTION METHODS

INSTALLATION OF EQUIPMENT IN VAULT OR PREFABRICATED METAL HOUSING

109-3.13 DUCT AND CONDUIT

ADD: The Contractor shall supply and install conduit and duct at the dimensions and nominal diameters shown in the plans.

109-3.15 WIRING AND CONNECTIONS

ADD: The Contractor shall remove the existing wiring and appurtenant equipment as shown in the plans in preparation for installation of the new or relocated electrical wireways and equipment. This shall include the reinstallation and/or repair of any lighting circuits which require temporary disconnection as a result of the work.

All wiring shall be in compliance with all local and state codes and the "National Electrical Code," latest edition.

ADD:

109-3.17 EXISTING EQUIPMENT RELOCATIONS AND REMOVALS

The Contractor shall relocate the existing equipment as detailed in the plans. Contractor shall be held responsible for any damage to the existing equipment caused by this relocation and shall repair such damage immediately to the satisfaction of the Engineer at no cost to the contract.

ADD:

109-3.18 TESTING

ADD: The installation shall be tested in operation as a completed unit prior to acceptance. Tests shall include resistance, voltage and current readings, as required by the Project Engineer. Testing equipment shall be furnished by

the Contractor. Tests shall be conducted as directed by the Project Engineer and shall be to his satisfaction. The Contractor shall be responsible for all equipment and conduit in place which will be connected to the new equipment, and any equipment or materials found to be defective or damaged shall be replaced by the Contractor at his own expense.

BASIS OF PAYMENT

109-5.1 ADD: Payment will be made at the contract lump sum price for each completed and accepted vault equipment installation. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

- Item AR109100 -- Construct Electrical Vault -- per lump sum.
- Item AR109110 -- Erect Prefabricated Vault -- per lump sum.
- Item AR109120 -- Erect Electrical Transclosure -- per lump sum.
- Item AR109210 -- Vault Modifications -- per lump sum.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 110 INSTALLATION OF AIRPORT UNDERGROUND ELECTRICAL DUCT

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 110 "Installation Of Airport Underground Electrical Duct" is modified as outlined below:

DESCRIPTION

Trenching and backfilling for ducts and conduits shall not be paid for separately, but shall be considered incidental to the associated duct or conduit.

EQUIPMENT AND MATERIALS

110-2.2, 2.3

DELETE: These Sections.

110-2.5 STEEL CONDUIT

DELETE: This Section.

ADD: Steel conduits shall be galvanized rigid steel (GRS).

110-2.7 PLASTIC CONDUIT

ADD: Conduits for concrete encasement shall be PVC, Schedule 40.

110-3.5 BACKFILLING

ADD: After the fifth paragraph:

All backfill and associated materials shall be considered incidental.

METHOD OF MEASUREMENT

110-4.1 DELETE: Entire Section.

ADD: The quantity of concrete encased duct to be paid for shall be the number of linear feet installed, measured in place, completed and accepted.

No separate measurements will be made for individual ducts in a multi-way duct system.

ADD:

110-4.2 The quantity of galvanized rigid steel conduit to be paid for shall be the number of linear feet installed, measured in place, completed and accepted.

BASIS OF PAYMENT

110-5.1 Topsoiling, seeding, and mulching of the duct trench shall not be paid for separately but shall be considered incidental to the associated duct.

Payment will be made under:

- Item AR110011 -- 1" Directional Bore -- per linear foot.
- Item AR110012 -- 2" Directional Bore -- per linear foot.
- Item AR110013 -- 3" Directional Bore -- per linear foot.
- Item AR110014 -- 4" Directional Bore -- per linear foot.
- Item AR110211 -- 1" Steel Duct, Direct Bury -- per linear foot.
- Item AR110212 -- 2" Steel Duct, Direct Bury -- per linear foot.
- Item AR110213 -- 3" Steel Duct, Direct Bury -- per linear foot.
- Item AR110214 -- 4" Steel Duct, Direct Bury -- per linear foot.
- Item AR110311 -- 1" Steel Duct, Jacked -- per linear foot.
- Item AR110312 -- 2" Steel Duct, Jacked -- per linear foot.
- Item AR110313 -- 3" Steel Duct, Jacked -- per linear foot.
- Item AR110314 -- 4" Steel Duct, Jacked -- per linear foot.
- Item AR110501 -- 1-Way Conc. Encased Duct -- per linear foot.
- Item AR110502 -- 2-Way Concrete Encased Duct -- per linear foot.
- Item AR110504 -- 4-Way Concrete Encased Duct -- per linear foot.
- Item AR110506 -- 6-Way Concrete Encased Duct -- per linear foot.
- Item AR110508 -- 8-Way Concrete Encased Duct -- per linear foot.
- Item AR110512 -- 12-Way Concrete Encased Duct -- per linear foot.
- Item AR110516 -- 16-Way Conc. Encased Duct -- per linear foot.
- Item AR110552 -- Extend 2-way Duct -- per linear foot.
- Item AR110554 -- Extend 4-way Duct -- per linear foot.

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR

ITEM 125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superceding any conflicting provisions thereof applicable to the work under the contract.

Item 125 "Installation Of Airport Lighting Systems" is modified as outlined below:

EQUIPMENT AND MATERIALS

125-2.1 GENERAL

ADD: Except as specified otherwise, all new equipment shall be provided by the Contractor and shall be tested for specification conformance as part of the Aviation Lighting Equipment Certification Program. Currently, these tests are performed by ETL Testing Laboratories. Certification of conformance as tested by ETL Testing Laboratories shall be provided by the manufacturer for all items submitted for approval. Equipment that has not been tested by ETL Testing Laboratories but is listed in Advisory Circular 150/5345-1U may be submitted for approval, provided that the manufacturer provides certification that the submitted equipment continues to meet FAA standards on which approval was originally made and that FAA standards for the equipment have not changed since the release of 150/5345-1U.

All lighting system construction shall include all items necessary to construct a complete unit including, but not restricted to, concrete bases, light cans, conduit, connectors, fixtures, and transformers.

The Contractor shall ascertain that all lighting system components furnished by him (including FAA approved equipment) are compatible in all respects with each other and remainder of the new/existing system. Any noncompatible components furnished by the Contractor shall be replaced by him at no additional cost with a similar unit, approved by the Engineer (different model or different manufacturer) that is compatible with the remainder of the airport lighting system.

125-2.3 CONCRETE

DELETE: This Section.

ADD: All Portland Cement concrete shall meet the requirements of Item 610.

125-2.7 ISOLATION TRANSFORMERS

New isolation transformers shall be as required by the contract Special Provisions and as shown in the plans.

125-2.8 LIGHT CANS

Light cans for the new concrete base mounted airfield signs, threshold, runway and taxiway lights and splice cans shall be L-867 Size B in conformance with FAA Advisory Circular AC 150/5345-42 (latest revision).

125-2.9 LIGHT LENS

Lenses for new runway edge lights both elevated and in-pavement shall be clear except for the last 2000' where the lights shall be 180° amber/180° clear.

Threshold light lenses shall be 180° red/180° green (red facing the runway).

Taxiway light lenses shall be blue.

125-2.11 AIRFIELD SIGNS

All signs shall be double faced.

Sign components, transformers, and lengths shall be as recommended by the manufacturer.

All signs shall conform with FAA Advisory Circular 150/5345-44 (latest edition) for Type L-858 Taxiway and Runway Signs. Manufacturer shall submit certification of compliance as tested by ETL Testing Laboratories.

125-2.12 SAND

Sand for backfill around lights, transformers, etc. shall be an IDOT FA-01, FA-02 or that approved by the Engineer.

125-2.13 OTHER ELECTRICAL EQUIPMENT

Junction boxes, transformers, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers or the National Electrical Manufacturers Association. When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the proposal and plans.

CONSTRUCTION METHODS

125-3.1 GENERAL

ADD: New edge lights, threshold lights and signs shall conform to the details and dimensions shown in the plans.

125-3.2 PLACING LIGHTS

The Contractor shall exercise caution in the installation of all light units. Any units damaged by the Contractor's operations shall be repaired or replaced to the satisfaction of the Engineer at no additional cost to the contract.

125-3.3 MAINTENANCE OF AIRFIELD LIGHTING DURING CONSTRUCTION

The Contractor shall maintain lighting of the runway and taxiways during the various phases of the work as shown on the sequence of construction or as directed by the Engineer.

The Contractor shall be responsible for all temporary connections in the field or at the regulator necessary for operation of the circuits during construction.

BASIS OF PAYMENT

Payment will be made under:

- Item AR125100 -- Elevated Retroreflective Marker -- per each.
- Item AR125410 -- MITL – Stake Mounted -- per each.
- Item AR125415 -- MITL – Base Mounted -- per each.
- Item AR125420 -- Taxiway Light Inpavement -- per each.
- Item AR125441 -- Taxi Guidance Sign, 1 Character -- per each.
- Item AR125442 -- Taxi Guidance Sign, 2 Character -- per each.
- Item AR125443 -- Taxi Guidance Sign, 3 Character -- per each.
- Item AR125444 -- Taxi Guidance Sign, 4 Character -- per each.
- Item AR125445 -- Taxi Guidance Sign, 5 Character -- per each.
- Item AR125446 -- Taxi Guidance Sign, 6 Character -- per each.
- Item AR125447 -- Taxi Guidance Sign, 7 Character -- per each.
- Item AR125448 -- Taxi Guidance Sign, 8 Character -- per each.
- Item AR125449 -- Taxi Guidance Sign, 9 Character -- per each.
- Item AR125461 -- Taxi Guidance Sign, Special -- per each.
- Item AR125470 -- Modify Existing Sign Panel -- per each.
- Item AR125505 -- MIRL, Stake Mounted -- per each.
- Item AR125510 -- MIRL – Base Mounted -- per each.
- Item AR125515 -- HIRL, Base Mounted -- per each.
- Item AR125525 -- HIRL, Inpavement -- per each.
- Item AR125540 -- MI Threshold Light Stake Mtd -- per each.
- Item AR125545 -- MI Threshold Light Base Mtd -- per each.
- Item AR125550 -- HI Threshold Light Base Mtd -- per each.
- Item AR125555 -- Threshold Lights, Inpavement -- per each.

Item AR125560 -- Runway Distance Remaining Sign -- per each.
Item AR125565 -- Splice Can -- per each.
Item AR125610 -- REILS -- per pair.
Item AR125615 -- PAPI (L-880 System) -- per each.
Item AR125620 -- Abbreviated PAPI (L-881 System) -- per each.
Item AR125901 -- Remove Stake Mounted Light -- per each.
Item AR125902 -- Remove Base Mounted Light -- per each.
Item AR125903 -- Remove Inpavement Light -- per each.
Item AR125904 -- Remove Taxi Guidance -- per each.
Item AR125905 -- Remove Rwy Distance Remain Sign -- per each.
Item AR125906 -- Remove Splice Can -- per each.
Item AR125907 -- Remove REILS -- per pair.
Item AR125908 -- Remove PAPI -- per each.
Item AR125909 -- Remove VASI -- per each.
Item AR125910 -- Remove PLASI -- per each.
Item AR125941 -- Adjust Stake Mounted Light -- per each.
Item AR125942 -- Adjust Base Mounted Light -- per each.
Item AR125943 -- Adjust Inpavement Light -- per each.
Item AR125944 -- Adjust Taxi Guidance -- per each.
Item AR125945 -- Adjust Rwy Distance Remain Sign -- per each.
Item AR125946 -- Adjust Splice Can -- per each.
Item AR125947 -- Adjust REILS -- per pair.
Item AR125948 -- Adjust PAPI -- per each.
Item AR125949 -- Adjust VASI -- per each.
Item AR125950 -- Adjust PLASI -- per each.
Item AR125961 -- Relocate Stake Mounted Light -- per each.
Item AR125962 -- Relocate Base Mounted Light -- per each.
Item AR125963 -- Relocate Inpavement Light -- per each.
Item AR125964 -- Relocate Taxi Guidance -- per each.
Item AR125965 -- Relocate Rwy Distance Remain Sign -- per each.
Item AR125966 -- Relocate Splice Can -- per each.
Item AR125967 -- Relocate REILS -- per pair.
Item AR125968 -- Relocate PAPI -- per each.
Item AR125969 -- Relocate VASI -- per each.
Item AR125970 -- Relocate PLASI -- per each.

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State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR101580 REFURBISH 36" BEACON

Effective: January 1, 2003

This Special Provision Modifies Item 101 Installation of Airport Rotating Beacons of the Standard Specifications.

DESCRIPTION

101-1.1 This item shall consist of the refurbishment of an existing airport rotating beacon in accordance with this Special Provision. This work shall include the mounting, leveling, wiring, painting, servicing, and testing of the beacon and all materials and incidentals necessary to place the beacon in operating condition as a completed unit to the satisfaction of the Engineer.

EQUIPMENT AND MATERIALS

101-2.5 WIRE

ADD: Wire shall be provided in accordance with Item 108-2.2(c).

CONSTRUCTION METHODS

101-3.1 Revise this section as follows:

The Contractor shall remove the existing beacon from the tower and perform the following items of work in accordance with current FAA requirements and specifications:

- (a) Completely dismantle the beacon, including glass and lenses.
- (b) Sandblast the frame and assemblies.
- (c) Replace the bearings and seals in the spindle.
- (d) Replace the wiring with #14 Teflon or silicon high-temperature insulated wire.
- (e) Install new terminal strips.

CHECK SHEET #1

- (f) Remove existing plug fuse holder and replace with a double cartridge type fuse holder. Fuse light and motor separately with fuse rated for 200,000 RMS interrupting capacity at 240 VAC.
- (g) The motor shall be removed. Conversion to a belt drive unit shall be provided. A new motor shall be provided and shall be UL Listed, ¼ hp at 115 VAC, 60 Hz, 1.10 service factor, with maximum amperage not to exceed 2.4 amps. The gear reducer shall provide the beacon RPM specified and have a minimum full torque of 200 inch pounds.
- (h) The beacon main drive shaft shall be completely dismantled and cleaned. New bearings and races shall be provided on the main drive shaft. All bearings shall be filled with grease at the time of re-assembly.
- (i) Grease fittings shall be provided on the edge of the mounting plate that holds the beacon head support ring and in the side of the bearing support shaft casing to provide grease for both the top and bottom bearings.
- (j) All removed glass shall be cleaned and resealed back in its original place on the beacon. Provide new cork or rubber cushions for each glass element. The sealing material shall have a guaranteed pliable life of at least 20 years.
- (k) The existing 1000 watt incandescent lamp system shall be replaced with an FAA approved high output, pulse-start metal halide lamp system delivering 44,000 lumens of output, and carrying a two-year warranty. Provide an FAA approved color filter to correct for the type of light emitted by the metal halide lamp.
- (l) Lighting assembly shall be converted to a stationary, non-rotating type. The light socket shall be mounted on a minimum ½" galvanized or plated pipe securely fastened to proper support members inside the beacon base. Support shall be centered in the beacon head assembly.
- (m) Lamp holder assembly shall be properly aligned, centered and leveled so that the lamp is in proper focus. Lampholder shall be adjustable both vertically and horizontally, and calibrated with permanent degree markings. The beam angle shall be set at 3 degrees.
- (n) The refurbished beacon shall be fitted with two L-810 obstruction lights mounted on top of the beacon, or remotely mounted on the platform. These obstruction lights shall be operated from a photocontrol integral to the beacon power pack that operates the beacon lamp, and which automatically de-energizes the obstruction lights when the beacon lamp reaches 60-70% brightness.

- (o) Provide all new fastening hardware including but not limited to, stainless steel bolts, lock washers, and nuts. Plated fasteners will not be allowed.
- (p) Repaint beacon – International orange.
- (q) After the beacon is reassembled, it shall be test-operated for at least two hours. Any irregularities shall be corrected. The Resident Engineer and the Airport Management shall witness this test.
- (r) The following vendors may furnish equipment and materials complying with this specification:
 - 1. Hali-Brite, Inc., PO Box 11, Crosby, MN 56441 – PH 218-546-7473.
 - 2. ECS, PO Box 1997, Greenwood, MS 38935 – PH 662-453-0588
 - 3. Crouse Hinds Aviation Lighting, 1200 Kennedy Road, Windsor, CT. 06095 – PH 203-683-4370.

After the beacon is refurbished, the Contractor shall replace the beacon back on top of the tower and connect it to the proposed wiring.

The Contractor shall have the option of performing refurbishing work on-site, or sub-contracting one of the acceptable vendors mentioned above to perform such work. If this option is chosen, the Contractor shall perform crating and shipping as required by the refurbishing vendor, and shall pay all shipping and refurbishing costs. The Contractor shall retain full responsibility for the satisfactory completion of this item. Any damage to the beacon caused by the Contractor or his agents while removing, refurbishing, or replacing the beacon, or incurred in transit from or to the airport, will be repaired at the Contractor's expense to the satisfaction of the Owner and the Engineer.

It is the Contractor's responsibility to examine the existing beacon BEFORE submitting a bid, to determine the number of broken, cracked, or otherwise unacceptable glass lenses that require replacement.

If an FAA approved vendor has a refurbished model DCB-36 rotating beacon in stock that meets these specifications, the existing beacon may be traded for a refurbished beacon. A beacon trade is preferred due to the extended service outage time of performing the work on-site. The refurbished beacon shall be a belt-drive type, with a stationary lamp, eliminating the existing slip ring assembly. If this option is chosen, the replacement beacon shall be ground-tested for two hours prior to setting on the tower. The Resident Engineer and the Airport Maintenance Superintendent shall witness this test.

If the work is performed on-site, a limit of five working days of complete service outage is allowed to complete the work.

CHECK SHEET #1

101-3.8 PANEL AND CABINET. Revise this section as follows:

The contractor shall remove one existing platform circuit breaker panel and furnish and install a proposed weatherproof panel at the base of the beacon tower, consisting of four 15-ampere breakers mounted in a weather-proof cabinet to provide separate protection for the circuits to the beacon lamps, motor, obstruction lights, and other equipment. The panel shall be located as shown on the Plans.

At the platform, provide a weatherproof safety switch mounted in place of the existing panel.

101-3.9 CONDUIT. Revise this section as follows:

All exposed wiring shall be run in not less than 1/2 inch liquid-tight metallic flexible conduit. Such conduit shall be UL Listed for grounding, with a copper strip factory-embedded in the metallic coil. Fittings shall be waterproof, and compatible with this type of conduit.

101-3.10 and 101-3.11 Delete these sections entirely.

101-3.12 OBSTRUCTION LIGHTS. Revise this section as follows:

Unless otherwise specified, the contractor shall install on the top of the beacon tower or mounting platform two L-810 obstruction lights on opposite corners, or optionally on top of the rotating beacon. If mounted on the platform, these lights shall be mounted on conduit extensions to a height of not less than 4 inches above the top of the beacon. If integral to the beacon, they shall be connected in series into the tell-tale photocontrol circuit with the necessary relay and wiring connections.

101-3.13 PAINTING. Delete all references to painting wood or steel towers. Painting as described in this section shall be required only for damage or marring of new metallic surfaces.

METHOD OF MEASUREMENT

101-4.1 The beacon refurbishment shall be paid for on a lump sum basis for a completed unit in place, accepted, and ready for operation.

BASIS OF PAYMENT

101-5.1 Payment will be made at the contract unit lump sum price for the completed airport rotating beacon refurbishment, and appurtenances specified herein or shown on the Plans. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these

materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item AR101580 -- Refurbish 36" Beacon -- per lump sum.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR106000 APRON LIGHTING

Effective: January 1, 2003

DESCRIPTION

1.1 The work under this item shall include the furnishing and installation of apron floodlights, light pole, light pole foundation, internal fusing, anchor bolts, fixture brackets, ballasts, and lamps. Installation shall include aiming of the luminaries to obtain the light levels specified herein and testing of light fixtures with portable power supply and the installation of light pole foundations of the depth shown on plans and specified herein.

1.2 Light pole locations are indicated on the plans and no deviation from these locations shall be permitted without the written approval of the Engineer.

A scaled computer analysis showing expected light levels on the apron shall be provided with the luminaries shop drawings. The input sheet shall also be provided and shall show all luminaries locations, mounting heights, aiming directions and tilts. Tilts in excess of 20 degrees shall not be allowed. A computer disk with photometrics in I.E.S. format shall also be submitted.

1.3 The shafts of the light pole foundations shall be cased to overcome unsuitable soil conditions and permit removal of water. The work shall be performed in a manner that will confine disturbance of surrounding materials to a minimum. The light pole foundations shall receive full lateral support from the surrounding materials.

Applicable standards include the current edition of the following:

- A. ACI 336.1 - Construction of End Bearing Drilled Piers.
- B. ASTM A252 - Welded and Seamless Steel Pipe Piles.

The installer of the light pole foundations shall not have less than five (5) years of documented experience in similar installations.

Light pole foundation construction shall conform to the requirements of all codes, regulations, ordinances or laws as may apply thereto. The Contractor is also required to be familiar with and to comply with all OSHA, EPA, and any other federal, state or local requirements which pertain to this work. All tests, materials or additional work called for by said requirements shall be provided at no extra expense to the Airport. **All poles supplied shall be certified to be vibration-free at all wind loads.**

EQUIPMENT AND MATERIALS2.1 LIGHT FIXTURESAPRON FLOODLIGHT

The apron floodlight fixture housing shall be formed from heavy gauge aluminum and shall be internally welded. All external hardware shall be stainless steel. The housing dimensions shall be as shown on the plans and the unit shall be U.L. listed for wet locations.

The lens frame shall be extruded, metered clear anodized aluminum and shall be welded into one piece and permanently fastened to the housing with a full length hinge.

The flat, thermal and shock resistant glass lens shall be sealed to the lens frame and secured with form corner keys.

The lens shall be silicone sealed in the extruded "U" channel lens frame. The lens frame shall be gasketed to the housing internal reinforcement ring with silicone impregnated Dacron type gasketing.

The luminaries shall have a type F reflector system. The reflector shall have a sharp cutoff at 70 degrees with maximum candlepower at 65 degrees. The multiple faceted, segmented reflector system shall be constructed of electro-brightened, anodized and sealed aluminum. Each reflector system shall be outfitted with porcelain base lamp holders and insulated lamp supports.

The reflector system shall also be fully enclosed. All photometric data shall be certified by an independent testing facility.

The fixture shall be mounted on the pole using the "K-swivel" knuckle for mounting on a pole with a 2.375" O.D. tenon. The swivel knuckle's cast aluminum adjustable knuckle shall be serrated for positive locking in position. The knuckle shall be provided with a fully enclosed integral junction box.

The fixture shall be pretreated, primed, baked, covered with a high solid polyester finish and baked again. Contractor shall verify finish color before ordering. The double baked finish shall meet or exceed all AAMA requirements for 1,000 hour salt spray exposure.

Luminaries shall be suitable for use with 1000W high pressure sodium lamps. Luminaries shall operate at 240VAC.

It shall be the responsibility of the Contractor to aim the proposed luminaries as directed by the Engineer.

CHECK SHEET #2

All lamps shall be 1000W high pressure sodium. One spare lamp shall be provided. Lamps shall be installed by Contractor just prior to testing of the system to reduce the possibility of breakage. Broken lamps shall be replaced and will not be paid for.

Units shall have ballasts operating on 240V, 1 phase, 60HZ and be capable of starting the lamps indicated herein down to a temperature of -20°F. Ballasts shall be of high power factor autotransformer type. They shall be an integral but easily replaceable part of the luminaries.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND HIS LIGHTING SUPPLIER TO PROVIDE ANY SHIELDING AND/OR AIMING OF LUMINARIES REQUIRED TO PREVENT GLARE FROM DIRECT OR REFLECTED LIGHT IN THE PILOT'S FIELD OF VISION.

2.2

LIGHT POLES

APRON LIGHT POLE

The proposed round tapered poles shall be of the type and height shown in the plans and shall be of one or two section design, unless otherwise shown in the plans. Each section shall be one-piece construction with a full length longitudinal weld and shall be cylindrical in cross-section having a uniform taper of 0.14 inches of diameter change per foot of length.

The anchor base shall be fabricated from a structural quality hot rolled carbon steel plate that meets or exceeds a minimum yield strength of 36,000 psi. The anchor base shall telescope the pole shaft and shall be circumferentially welded at top and bottom.

Anchor bolts shall also be supplied by the pole manufacturer. Anchor bolts shall be fabricated from a commercial quality hot rolled carbon steel bar that meets or exceeds a minimum yield strength of 50,000 psi. Four properly sized anchor bolts, each furnished with two regular hex nuts and washers, shall be furnished and shipped with the poles. Anchor bolts shall have the threaded end galvanized a minimum of 8 inches.

The pole shall also have an 5" x 8" handhole and opening for receptacle located 1'-6" above the base. Pole color shall be as shown in the plans. Poles shall come complete with mounting plates for mounting of proposed fixture brackets.

The Contractor shall verify finish color and size before ordering the proposed poles and shall submit shop drawings on all parts of the poles including the poles, brackets, tenons, handholes, mounting methods, colors, finish procedures and written warranties.

Brackets for light poles shall be as detailed on the plans. Brackets, poles and fixtures shall be matched for a perfect fit. Bracket shall have mounting plate attached that matches mounting plate on proposed poles. Bracket stubs for installation of fixtures shall be suitable for slipfitter furnished with

floodlight fixture and shall come as a complete unit with any adapters which also may be required. Each bracket shall be capable of supporting two (2) fixtures and one (1) obstruction light.

2.3 LIGHTNING ARRESTERS

Each pole shall be furnished with a 240V or 480V, respectively, lightning arrester. Lightning arrester shall have 3200V impulse sparkover and shall have a minimum of 10000A discharge current. Lightning arresters shall be installed in the light pole handholes.

2.4 LIGHT POLE FOUNDATIONS

Apron light pole foundations shall be as shown in the plans. Reinforcing steel shall be installed as detailed on plans.

Anchor bolts shall be supplied by the pole manufacturer and shall be installed according to his recommendations. Anchor bolts shall be "L" shaped and shall be minimum 1" diameter, 36" long with 7" "L" unless otherwise recommended by the pole manufacturer.

Foundations shall conform to the applicable sections of Item 610.

Light pole foundations shall extend 30" above finished grade.

Breakaway couplings and skirt shall be provided for each base mounted pole.

2.5 INTERNAL WIRINGS

All fusing shall be accessible through the pole handhole for the light poles. Contractor shall provide the waterproof splices, breakaway fuse holders, fuses and other miscellaneous items necessary for a complete installation. The breakaway fuse holders and fuses shall be manufactured by Bussman or equal. All splicing of wiring from main power wiring to #10 wiring within pole shall be done at concrete handhole at each pole. All fuses and lightning arrestors shall be within the light pole handhole.

2.6 GROUND RODS

All light poles shall be furnished with a ground rod as detailed in the plans. The proposed ground rods shall be $\frac{3}{4}$ " diameter, 10' long copper clad. The top of the rod shall be buried min. 12" below finished grade. All the connections to the ground rod shall be buried min. 12" below finished grade. All the connections to the ground rods shall be one shot exothermic welding as manufactured by Cadweld or equal.

CONSTRUCTION METHODS

CHECK SHEET #2

3.1 POLES AND LUMINARIES

Poles and luminaries shall be assembled and wired on the ground, then lifted and bolted in place plumb. The pole shall be considered plumb when the center of the top is directly over the center of the base. Plumb is to be measured with a transit by the Contractor and checked by the Resident Engineer.

Wiring run from luminaire to pole base shall have a strain relief clamp provided at the entry to the luminaire to prevent the wires from pulling loose from their terminals at the luminaire.

Internal wiring of poles and luminaires including fuses and waterproof splices shall be incidental to this item.

Poles and luminaires shall be set on their foundations such that the luminaires aim in the direction indicated on the plans.

All proposed poles shall be grounded to ground rods. Contractor shall use one shot exothermic weld by Cadweld or equal.

3.2 LIGHT POLE FOUNDATIONS

The Contractor shall be responsible for the necessary concreting and formwork to install the foundations as detailed on the plans.

The Contractor is referred to Item 610, which covers the proper installation of the concrete.

Foundations shall extend as shown on the plans below finished grade or pavement. Foundations shall extend thirty inches (30") above finished grade.

Anchor bolts shall be set according to the bolt circle requirements of the poles supplied. They shall be so arranged that when the pole and luminaire is erected, the luminaire will be properly aimed.

3.2 POWER AND CONTROL

The location of power and control materials and work to be performed shall be as indicated in the plans. Electrical cable is specified in Item 108. The Contractor shall furnish and install identifying tags on all wires at the point where they connect to the breaker indicating which lights the wires serve. The Contractor shall stencil an identifying label on the control panel enclosure.

3.3 RESTORATION

All areas disturbed by the light fixture installation and storing of dirt and other work shall be restored to its original condition. The restoration shall include any necessary topsoiling, fertilizing, seeding or sodding and shall be performed in accordance with the Standard Turfing Specifications. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance.

METHOD OF MEASUREMENT

4.1 The quantity of light poles to be paid for under this item shall be the number of units furnished and installed ready for operation. Each unit shall consist of the fixtures, brackets, fuses, internal wiring, ground rods, light pole foundations and any miscellaneous items and fittings required to make the unit operational.

Each unit shall consist of the ballast, housing, and any other items required for successful operations.

BASIS OF PAYMENT

5.1 Payment will be made at the contract unit price for each light pole complete with fixtures, electrical wiring, ground rods and foundation and any other accessories completed by the Contractor and accepted by the Engineer. These prices shall consist of full compensation for furnishing and material, backfilling and compacting trenches, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under

- Item AR106502 -- Apron Light Pole W/ DoubleTriple Fixture -- per each.
- Item AR106503 -- Apron Light Pole W/ Triple Fixture -- per each.
- Item AR106504 -- Apron Light Pole W/ Quad Fixture -- per each.

CHECK SHEET # 3

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR119000 AIRPORT OBSTRUCTION LIGHTING

Effective: January 1, 2003

RESERVED

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR127000 AIRPORT NAVAID INSTALLATION

Effective: January 1, 2003

RESERVED

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR150510 ENGINEER'S FIELD OFFICE

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of furnishing and maintaining in good condition, for the exclusive use of the Resident Engineer, a weather-proof building hereinafter described, at locations approved by the Engineer. Unless otherwise approved, the buildings shall be independent of any buildings used by the Contractor, and all keys to the buildings shall be turned over to the Resident Engineer. The Engineer will designate the location of the building, and it shall remain on the jobsite until released by the Engineer. (Mobile units may be substituted with the approval of the Engineer.)

ENGINEER'S FIELD OFFICE

- 2.1 Field offices shall have a ceiling height of not less than seven feet (7'), and a floor space of not less than two hundred forty (240) square feet. The office shall be provided with sufficient heat, natural and artificial light, and air conditioning. Doors and windows shall be equipped with locks approved by the Resident Engineer. Windows shall be equipped with interior shades, curtains or blinds. Suitable sanitary facilities separate from those for the Contractor's personnel, meeting Federal, state and local health department requirements shall be provided and maintained clean and in good working condition, and shall be stocked with lavatory and sanitary supplies at all times during the period of the contact.

In addition, the following equipment and furniture meeting the approval of the Resident Engineer shall be furnished:

- (a) 2 desks and 2 nonfolding chairs with upholstered seat and back
- (b) 1 drafting table, min. top size of 37 1/2" x 48" and adjustable, upholstered drafting stool
- (c) 2 free-standing file cabinets, legal size, 4 drawer
- (d) 4 folding chairs
- (e) 1 equipment cabinet of minimum inside dimension of 44" high x 24" wide x 30" deep with lock. The walls shall be of steel with a 3/32" minimum thickness with concealed hinges and enclosed lock constructed in such a manner as to prevent entry by force. The cabinet assembly shall be permanently attached to a structural element of the field office in a manner to prevent theft of the entire cabinet.
- (f) 1 carbon dioxide fire extinguisher (10 lb. rated capacity)
- (g) 1 water cooler with water supply as needed

- (h) 1 telephone, with touch tone, where available, and telephone answering machine, for exclusive use by the Resident Engineer. Two additional dedicated telephone lines, one for fax, and one for computer shall also be provided for the exclusive use of the Resident Engineer.
- (j) 1 dry process copy machine (including maintenance and operating supplies) capable of both collating and reproducing prints up to a legal size (8.5" x 14") and capable of copying field books
- (k) 1 standard facsimile machine (FAX) (including maintenance and operating supplies), with dedicated phone line
- (l) Beam tank(s)*
- (m) 1 office style refrigerator (min. 8 c.f. w/freezer unit)
- (n) 1 electric desk tape calculator and adding machine with tape or 1 tape printing calculator

* For projects requiring PCC flexural strength testing, the Contractor shall provide a beam tank shed as part of this item. This shed shall be large enough to hold all the necessary beam tanks. The Contractor shall make provisions in this shed to heat/cool as necessary to keep beam tank water temperature between 70° - 76°F. The Contractor shall be required to provide water to the beam shed as required to protect the beams. If the beam tank is not located at the Engineer's Field Office, the shed shall be large enough to store the beam breaker. The shed shall be locked and the Resident Engineer given all keys.

BASIS OF PAYMENT

3.1

The building will include all utility costs and shall be released to the Contractor in good condition at the end of the project.

Payment for providing the field office fully equipped as specified shall be made at the contract lump sum price. The Resident Engineer shall make payment for all long distance phone calls made by his representatives or himself.

Payment will be made under:

Item AR150510 -- Engineer's Field Office -- per lump sum.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR150560 TEMPORARY THRESHOLD

Effective: January 1, 2003

DESCRIPTION

1.1 This item shall consist of the installation, maintenance and removal of temporary thresholds at the locations shown in the plans.

Installation and removal shall include the following:

- Installation and removal of temporary "jumper" cables as shown in the plans to keep all circuits operable.
- Covering of distance-to-go sign legends when called for in the plans.
- Disconnection and re-connection of all runway lights within the closed portion of the runway.
- Installation and removal of temporary threshold lights and required materials for installation.
- Relocation of amber filters/lenses from the closed areas to the first 2,000' of the open runway when called for in the plans.
- Temporary markings and marking removals shown in the plans.
- Furnishing and installing new Runway End Identifier Lights (REILs) at the temporary threshold when called for in the plans.

Maintenance shall include all materials, equipment and labor necessary to keep the temporary threshold lighting operating as required.

EQUIPMENT AND MATERIALS

2.1 Cable and connections shall be in accordance with Item 108.

2.2 Threshold lights shall be in accordance with Item 125.

2.3 TEMPORARY REILS

When called for in the plans, temporary REILs shall be installed at the temporary threshold.

The Contractor shall furnish and install a series circuit power adaptor to convert the runway edge light constant current series circuit power into the 120/240 VAC power needed by the existing REILs. The power adaptor shall be furnished by the manufacturer of the existing REILs and shall be

compatible with the existing REILs. The Contractor shall obtain the manufacturer and model number for the existing REILs from the Airport.

The power adapter and associated wiring shall be buried underground.

Power and control wiring shall be as required by REIL manufacturer and as specified in Item 108.

CONSTRUCTION METHODS

3.1 GENERAL

Placing and removal of the temporary thresholds shall be scheduled to minimize closures of the runways. Closure periods outlined in the Plans are maximums and should not be exceeded. Multiple crews shall be used if necessary to complete the work within the closure period.

3.2 LIGHTING

At the location of the temporary relocated thresholds, temporary lights shall be installed 10' off pavement edge at 10' spacing, on each side of the runway as shown in the plans. Temporary lights may be the threshold lights and transformers from the relocated runway.

The Contractor shall make all temporary connections necessary to complete the existing runway circuit.

3.3 MASKING OF LEGENDS

The Contractor shall cover or mask completely the existing legends of the distance-to-go signs when called for in the plans.

3.4 DISABLING LIGHTS

The Contractor shall disable or render inoperable all runway edge lights in the closed portion of the runway by disconnecting the light at the transformer.

3.5 DISABLING APPROACH LIGHTS AND NAV-AIDS

The Contractor shall disable or render inoperable all approach lighting systems and navigational aids associated with the closed portion of the runway or affected by the proposed construction by disconnecting the systems at the vault.

3.6 RELOCATION OF LENSES

The Contractor shall relocate the existing filters or lenses from the closed portion of the runway to the first 2,000' of the active portion of the runway when called for in the plans.

3.7 REMOVAL OF TEMPORARY THRESHOLD

Upon completion of the specified work, the temporary threshold lights shall be removed and the runway circuit shall be completed.

3.8 TEMPORARY MARKINGS

Temporary markings shall conform to Item 620.

3.9 MARKING REMOVAL

Marking removal shall conform to Item 620.

3.10 TEMPORARY REILS

Temporary REILs shall be installed as detailed on the plans.

The REIL power and control wiring shall be installed as required by REIL manufacturer and in compliance with Item 108.

3.11 REIL REMOVAL

When called for in the plans, upon completion of the specified work, the temporary REILs and power adaptor shall be removed, cleaned and refurbished as required and turned over to the Airport.

METHOD OF MEASUREMENT

4.1 The installation and removal of the temporary threshold lighting shall be measured as a lump sum item completed and accepted by the Engineer.

BASIS OF PAYMENT

5.1 Payment for this item shall be at the contract lump sum for the completed work. This price shall be full compensation for furnishing all material, for all preparation, assembly and installation of materials, for all removals, lighting, coverings, restoration and for all labor, equipment, tools and incidentals necessary to complete the item.

Costs associated with maintenance of the temporary threshold shall be considered incidental to the overall contract and not included in the lump sum items below.

Payment will be made under:

Item AR150560 -- Temporary Threshold -- per lump sum.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR152540 SOIL STABILIZATION FABRIC

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of placing a soil stabilization fabric on a prepared subgrade prior to the placement of aggregate base as shown in the plans.

MATERIALS

- 2.1 Geotextile Fabric for Soil Stabilization. Fabric for soil stabilization shall consist of woven or nonwoven filaments of polypropylene, polyester, or polyethylene. Nonwoven fabric may be needle punched, heat-bonded, resin-bonded, or combination thereof. The fabric shall be resistant to ultraviolet radiation and shall comply with the following physical properties.

Physical Properties (English)	Requirements
Grab tensile strength (lbs) - ASTM D 4632	200 (min.) ^{1/}
Grab elongation @ break (%) - ASTM D 4632	12 (min.) ^{1/}
Burst strength (psi) – ASTM D 751	250 (min.) ^{2/}
Trapezoidal tear strength (lbs) ASTM D 4533	75 ^{2/}
Width (ft.)	-----
Weight (oz/sq yd.) - ASTM D 3776	4.0 (min.)
Equivalent opening size (EOS) Sieve No. – Corps of Engrs. CS-02215	-----

CHECK SHEET #7

Physical Properties (Metric)	Requirements
Grab tensile strength (N) - ASTM D 4632	900 (min.) ^{1/}
Grab elongation @ break (%) - ASTM D 4632	12 (min.) ^{1/}
Burst strength (kPa) – ASTM D 751	1720 (min.) ^{2/}
Trapezoidal tear strength (N) ASTM D 4533	335 ^{2/}
Width (m)	-----
Weight (g/m ²) – ASTM D 3776	135 (min.)
Equivalent opening size (EOS) Sieve No. – Corps of Engrs. CS-02215	-----

1/ For woven fabric, test results shall be referenced to orientation with warp or weave, whichever the case may be. Both woven and nonwoven fabric shall be tested wet.

2/ Test results may be obtained by manufacturer's certification.

CONSTRUCTION METHODS

3.1 The soil stabilization separation fabric shall be installed in conformance with the applicable requirements of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2002.

Soil Stabilization fabric will comply with construction methods outlined in Section 210 Fabric for Ground Stabilization.

METHOD OF MEASUREMENT

4.1 The area of soil stabilization fabric shall be the square yards of soil stabilization fabric satisfactorily placed and accepted by the Engineer.

BASIS OF PAYMENT

5.1 Payment shall be made at the contract unit price for soil stabilization fabric installed on the project. These prices shall be full compensation for furnishing all materials, labor, equipment and any incidentals necessary to install the soil stabilization fabric shown on the plans and specified herein.

Payment will be made under:

Item AR152540 -- Soil Stabilization Fabric -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR156000 EROSION CONTROL

Effective: January 1, 2003

DESCRIPTION

- 1.1 This work shall consist of constructing temporary and permanent erosion control systems as shown on the plans or as ordered by the Resident Engineer during the life of the contract to control erosion and sediment damage to the adjacent properties and water resources through the use of ditch checks, inlet sedimentation control, erosion control silt filter fence and temporary seeding.

As part of this item, the Contractor shall be required to comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) Storm Water Permit for construction site activities.

Information on the above-referenced permits may be obtained from:

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Springfield, Illinois 62702

MATERIALS

- 2.1 SILT FENCE

This fence shall either be a prefabricated silt fence meeting the dimensional requirements and details shown in the plans or shall be a silt fence fabricated on site conforming to the requirements contained in Specification 161 for 39" woven wire fence with metal "T" posts except that no special corner posts, bracing or P.C.C. will be required and a 36" width of filter fabric shall be secured to the bottom of the fence on its upstream side as shown in the plans.

Geotextile fabric for silt fence shall consist of woven or nonwoven filaments of polypropylene, polyester or polyethylene. Nonwoven fabric may be needle punched heat-bonded, resin-bonded or combination thereof. The filaments in the Silt Filter Fence Fabric must be dimensionally stable (i.e., to each other), resistant to delamination, and must be free from any chemical treatment or coating that might significantly reduce porosity and permeability. Both fabrics shall be resistant to ultraviolet radiation. If stored

CHECK SHEET #8

on the jobsite prior to its use, it shall be protected from exposure to direct sunlight. The fabrics shall comply with the physical properties.

Properties	Dimension	
Width, m (ft.)	1 (3.5) min.	
Weight [g/m ² (oz./sq.yd.)]	135 (4.0) min.	ASTM D 3776
Grab Tensile Strength, N (lbs.)	900 (200) min. ^{1/}	ASTM D 4632
Grab Elongation Elongation @ Break (%)	15 min. ^{1/}	ASTM D 4632

Properties	Dimension	
Burst Strength, kPa(psi)	1725 (250) min. ^{2/}	AST D3786
Equivalent Opening Size (EOS) Sieve No.	600 um (30) min. (nonwoven) ^{2/}	Corps of Engrs. CW-02215
	300 um (50) min. (woven) ^{2/}	

^{1/} The fabric shall be tested wet in both warp and fill directions in accordance with ASTM D1682, Grab Test, G using a 100 mm (4-inch) by 200-mm (8 inch) sample, 75-mm (3 inch) gage length, 300-mm (12 inch) per minute in a CRE testing machine. The average of 5 tests in each direction shall meet the minimum value given above.

^{2/} Manufacturer's certification that the fabric meets the minimum value.

2.2 BALE STAKES

Shall be four feet minimum length each and be either of sound wood 1" square (minimum) or #4 rebar.

2.3 HAY OR STRAW BALES

Shall be either hay or straw approved by the Resident Engineer compacted and adequately bound by wire.

2.4 TEMPORARY MULCH

Temporary mulch shall meet the requirements of Item 908.

2.5 TEMPORARY SEED

Temporary grass seed shall be a quick growing species (such as cereal grain of wheat, rye or oats) suitable to the area to provide a temporary cover.

CONSTRUCTION METHODS3.1 GENERAL

The Contractor shall conduct his construction operations in accordance with the latest revision of the Illinois Environmental Protection Agency publication "Standards and Specifications for Soil Erosion and Sediment Control".

Erosion control must be considered by the Contractor prior to exposing any erodible material. Erosion protection for Contractor furnished borrow pits, equipment storage sites, plant sites and haul roads shall be provided by the Contractor.

The Contractor has the responsibility to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and to provide immediate permanent or temporary pollution control measures. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical.

Slopes that erode easily shall be temporarily seeded as the work progresses with a cereal grain of wheat, rye or oats obtained from a local supplier or seed store. The cereal grains may be planted by a hand seeder or other acceptable method and covered by a drag or harrow to provide a quick cover crop. Inspection of the cereal grain seed will not be required. The intent of using cereal grains as temporary erosion control is to permit the Contractor to quickly seed potential areas as the need arises with on-site personnel and equipment.

3.2 TEMPORARY EROSION CONTROL

The installation and maintenance of silt fence or bales shall be at the locations shown on the plans, or as directed by the Resident Engineer.

3.3 TEMPORARY DITCH CHECKS

Temporary Ditch Checks shall be constructed by placing silt fence and bales at intervals of not greater than 200 feet along ditch lines, or as directed by the Resident Engineer.

3.4 SILT FENCE

The installation and maintenance of silt fence shall be at the locations shown on the plans, or as directed by the Resident Engineer.

The Contractor shall maintain the alignment and condition of the silt fence, as necessary, throughout its use on the project. Upon completion and/or as directed, the Contractor shall remove the silt fence from the project.

CHECK SHEET #8

3.5 STRAW BALE BARRIER

The installation and control of straw bale barriers shall be at the location shown in the plans, or as directed by the Resident Engineer.

3.6 DUST CONTROL

The Contractor shall employ construction methods and means that will keep flying dust to the minimum as directed by the Resident Engineer. The Contractor shall provide for the laying of water on the project, and on roads, streets, aprons and other areas immediately adjacent to the project limits, wherever traffic, or buildings that are occupied or in use, are affected by such dust caused by hauling or other operations. The cost of carrying out the foregoing provisions shall be incidental to the contract.

3.7 MAINTENANCE AND REMOVAL OF TEMPORARY EROSION CONTROL SYSTEM

The temporary erosion control systems installed by the Contractor shall be properly maintained as directed by the Resident Engineer to control siltation at all times during the life of the contract. Any additional material and work required by the Resident Engineer will be measured and paid as herein specified. If the Contractor fails to maintain the temporary erosion control systems as directed by the Resident Engineer, the Resident Engineer may at the expiration of a period of 48 hours, after having given the Contractor written notice, proceed to maintain the systems as deemed necessary, and the cost thereof shall be deducted from any compensation due, or which may become due the Contractor under this contract.

3.8 REMOVAL OF EROSION CONTROL

The Contractor shall remove temporary erosion control structures when ordered to do so by the Resident Engineer. The costs associated with the removals shall be incidental to this item. In the event that temporary erosion and pollution control measures are ordered by the Resident Engineer due to the Contractor's negligence or carelessness, the work shall be performed by the Contractor at his own expense.

METHOD OF MEASUREMENT

4.1 The footage of Silt Fence to be paid for shall be the number of lineal feet of silt fence measured in-place, satisfactorily installed and maintained throughout the duration of the contract.

4.2 The number of hay or straw Bales paid for shall be the number of hay or straw bales shown in the plans or ordered by the Resident Engineer used to control erosion.

4.3 Temporary seeding with a cereal grain shall not be measured for payment. It shall be considered incidental to Item 901 - Seeding.

BASIS OF PAYMENT

5.1 Payment will be made at the contract unit price per linear foot of Silt Fence and at the contract unit price per each for Bales. This price shall be full compensation for furnishing all materials for all preparation and installation of these materials, including excavation, placement, tie-down stakes, staples, maintenance and removal and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item AR156510 -- Silt Fence -- per lineal foot.

Item AR156512 -- Bales -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR156513 SEPARATION FABRIC

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of placing a separation fabric on a prepared subgrade prior to the placement of aggregate base as shown in the plans.

MATERIALS

- 2.1 SEPARATION FABRIC The separation fabric material shall consist of nonwoven filaments formed from a plastic yarn of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, or polyesters, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. After forming, the fabric shall be processed so that the filaments retain their relative positions with respect to each other. The fabric shall be free of defects or flaws which significantly affect its physical and/or filtering properties.

The separation fabric shall be formed in widths of not less than 6 feet (2 m). Sheets of fabric may be sewn together with thread of a material meeting the chemical requirements given for the plastic yarn to form fabric widths as required. The sheets of filter fabric shall be sewn together at the point of manufacturer or another approved location. The separation fabric shall be rot proof, mildew proof, insect resistant, have a high dimensional stability when set, have good soil filtration characteristics, have a high resistance to tear propagation in all directions, and meet the following minimum conditions and ASTM Tests for the gradation of riprap specified:

PHYSICAL PROPERTIES ENGLISH UNITS	
Weight of Fabric (oz/sq yd), ASTM D 3776 (Mod.)	6.0
Burst Strength (psi), ASTM D 3786 (Note 1)	250
Trapezoidal Tear Strength (lbs), ASTM D 1117 (Note 2)	60
Grab Tensile Strength (lbs), ASTM D 4632 (Note 2)	160
Grab Tensile Elongation (%), ASTM D 4632 (Note 2)	20

PHYSICAL PROPERTIES METRIC UNITS	
Weight of Fabric (g/m ²), ASTM D 3776 (Mod.)	200
Burst Strength (kPa), ASTM D 3786 (Note 1)	1720
Trapezoidal Tear Strength (N), ASTM D 1117 (Note 2)	265
Grab Tensile Strength (N), ASTM D 4632 (Note 2)	700
Grab Tensile Elongation (%), ASTM D 4632 (Note 2)	20

Note 1. Manufacturer's certification of fabric to meet requirements.

Note 2. Test sample shall be tested wet.

The vendor shall furnish certified test reports with each shipment of material attesting that the fabric meets the above requirements.

CONSTRUCTION METHODS

- 3.1 The separation fabric shall be installed in conformance with the applicable requirements of the IDOT Standard Specifications for Road and Bridge Construction, adopted January 1, 2002.

Separation fabric will comply with construction methods outlined in Section 210 Fabric for Ground Stabilization.

METHOD OF MEASUREMENT

- 4.1 The area of separation fabric shall be the square yards of separation fabric satisfactorily placed and accepted by the Engineer.

BASIS OF PAYMENT

- 5.1 Payment shall be made at the contract unit price for separation fabric installed on the project. These prices shall be full compensation for furnishing all materials, labor, equipment and any incidentals necessary to install the separation fabric shown on the plans and specified herein.

Payment will be made under:

Item AR156513 -- Separation Fabric -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR156540 RIPRAP

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of furnishing, transporting, and placing a protective course of stone, minimum 12 inches depth, laid as riprap on filter fabric in the areas designated and as detailed on the construction plans. Specific locations requiring riprap are identified on the construction plans.

MATERIALS

- 2.1 RIPRAP: The stone material shall meet the requirements of Article 1005.01 of the IDOT Standard Specifications for Road and Bridge Construction. The stone used for the riprap shall meet the gradation shown on the plans

- 2.2 FILTER FABRIC: The filter fabric material shall consist of nonwoven filaments formed from a plastic yarn of a long-chain synthetic polymer composed of at least 85 percent by weight of polyolefins, or polyesters, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. After forming, the fabric shall be processed so that the filaments retain their relative positions with respect to each other. The fabric shall be free of defects or flaws which significantly affect its physical and/or filtering properties.

The filter fabric shall be formed in widths of not less than 6 feet (2 m). Sheets of fabric may be sewn together with thread of a material meeting the chemical requirements given for the plastic yarn to form fabric widths as required. The sheets of filter fabric shall be sewn together at the point of manufacturer or another approved location.

The texture of the fabric shall be such that the bedding and riprap will remain in an equilibrium state and not slip or slide. The filter fabric shall be rot proof, mildew proof, insect resistant, have a high dimensional stability when set, have good soil filtration characteristics, have a high resistance to tear propagation in all directions, and meet the following minimum conditions and ASTM Tests for the gradation of riprap specified:

ENGLISH UNITS	Gradation 4 & 5	Gradation 6 & 7
Weight of Fabric (oz/sq yd), ASTM D 3776 (Mod.)	6.0	8.0
Burst Strength (psi), ASTM D 3786 (Note 1)	250	300
Trapezoidal Tear Strength (lbs), ASTM D 1117 (Note 2)	60	75
Grab Tensile Strength (lbs), ASTM D 4632 (Note 2)	160	200
Grab Tensile Elongation (%), ASTM D 4632 (Note 2)	20	20

METRIC UNITS	Gradation 4 & 5	Gradation 6 & 7
Weight of Fabric (g/m ²), ASTM D 3776 (Mod.)	200	270
Burst Strength (kPa), ASTM D 3786 (Note 1)	1720	2070
Trapezoidal Tear Strength (N), ASTM D 1117 (Note 2)	265	335
Grab Tensile Strength (N), ASTM D 4632 (Note 2)	700	900
Grab Tensile Elongation (%), ASTM D 4632 (Note 2)	20	20

Note 1. Manufacturer's certification of fabric to meet requirements.

Note 2. Test sample shall be tested wet.

The vendor shall furnish certified test reports with each shipment of material attesting that the fabric meets the above requirements.

The fabric shall meet the requirements noted in the following and provide an AOS (apparent opening size) determined by the Engineer after an on-site investigation of the soil to be protected, based on the following criteria:

(a) Piping Resistance. (soil retention) (Note 1)

(1) Soil with 50 percent or less particles by weight (mass) passing U.S. No. 200 (75 μ m) Sieve. AOS less than 0.6 mm [greater than No. 30 (300 μ m) Sieve] TF25 Method 6.

(2) Soil with more than 50 percent particles by weight (mass) passing U.S. No. 200 (75 μ m) Sieve. AOS less than 0.3 mm [greater than No. 50 (300 μ m) Sieve] TF25 Method 6.

(b) Permeability. (cm/sec)(Note 1). K of fabric greater than 10K of soil - ASTM D 4491.

CHECK SHEET #10

Note 1. Certification from the manufacturer of fabric is required stating that the product meets the piping resistance and permeability requirements.

CONSTRUCTION METHODS

- 3.1 Prior to placement of the riprap material, the Contractor will undercut the designated area twelve (12") in. below finish grade. The undercut material will be used as embankment fill material. The riprap course will be 12 in. total depth.

The riprap shall be placed in such a manner as to produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids. Placing of materials shall begin at the lower elevations and progress up the slope. The larger pieces shall be well distributed and the entire mass in its final position shall be roughly graded and shall present an even, close surface true to line and grade. Desired distribution of various sizes shall be obtained by selective loading or by controlled dumping methods which will produce the specified results.

METHOD OF MEASUREMENT

- 4.1 The quantity of riprap to be paid for shall be the number of square yards of riprap material placed and accepted by the Resident Engineer.

BASIS OF PAYMENT

- 5.1 Payment shall be made at the contract unit price bid per sq. yds. for riprap. This price shall be full compensation for labor, equipment, material, including fabric and all incidentals associated with undercutting, shaping, and placing the riprap in accordance with the special provisions and the construction drawings.

Payment will be made under:

Item AR156540 -- Riprap -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201001 BITUMINOUS BASE COURSE – METHOD I
(Under 2,500 tons/pay item/location)

Effective: January 1, 2003

This Special Provision Modifies Item 201 Bituminous Base Course of the Standard Specifications.

201-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the bituminous base course.”

“The bituminous base course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

201-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, or recyclable asphalt pavement (RAP), blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Recyclable Asphalt Pavement (RAP): Recyclable asphalt pavement shall be defined as the product resulting from milling and/or crushing of bituminous concrete pavement composed of aggregates and asphalt that originally met the quality requirements as stated herein. The Contractor shall furnish evidence satisfactory to the Division and the FAA that the material met the specified quality requirements.

CHECK SHEET #11

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

201-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:
“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST (IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	20
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	4.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	8.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>10.0</i>

Delete the second and third paragraphs.

201-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:
“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and alumin-

silicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

[1] Fine aggregate shall not contain more than 3 percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

201-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.

201-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the bituminous base course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways Source Certification Program (AGCS). The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures

CHECK SHEET #11

are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

201-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

“Once the source(s) of the aggregates have been approved by the Engineer, the Contractor shall furnish to the Engineer the quarry quality control gradations and the gradations of stockpile samples obtained for the purpose of performing the mix design.”

201-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.”

201-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Engineer is responsible for the job mix formula (JMF) and no bituminous mixture for payment shall be produced until the approved JMF is submitted to the Contractor in writing by the Project Engineer. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, pursuant to completion of the JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”*

Delete the third paragraph and replace with the following:

“The bituminous mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	2-4	2-3
Voids filled with asphalt (%)	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the Job Mix Formula. The exact amount of

stone sand will be determined by the Engineer based on preparation of the Mix Design.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Add the following sentence to the end of the fifth paragraph:

“When approved by the Engineer, the Contractor may add up to 25 percent of recyclable asphalt pavement to meet the required gradations, provided he can produce a consistent mixture meeting the mix design, temperature, and density requirements specified herein.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”* These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

201-3.4 TEST SECTION

Delete this section.

201-4.2 BITUMINOUS MIXING PLANT

Insert the following as the first paragraph:

“The bituminous hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I bituminous mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of IDOA’s latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures”* for Quality Control and acceptance testing during periods of mix

CHECK SHEET #11

production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

201-4.3 HAULING EQUIPMENT

ADD: All trucks used for hauling bituminous mixtures shall have a tightly closing tailgate to prevent spilling of material on airfield pavements or entrance roads used for haul roads. Prior to leaving the placing site, the end of the truck beds shall be cleaned of all loose material which may spill onto the pavements and the tail gate shall be secured.

201-4.4 BITUMINOUS PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:
“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:
“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second sentence of the third paragraph and replace with the following:
“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

201-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:
“Immediately after heating, the base course aggregate(s) shall be screened into at least four sizes. This requirement does not apply to drum mixer plants.”

201-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following to the end of the third paragraph:
“The Engineer may increase the asphalt content of the first lift by up to 0.3 percent when the bituminous mixture is placed directly on a prepared subgrade.” Add the following paragraph after the fourth paragraph:
“The first lane of the first lift of the bituminous base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid

pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of base course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

201-4.10 COMPACTION OF MIXTURE

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

201-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in the most recent issue of the N.A.P.A. *Superintendent’s Manual* on compaction of asphalt pavements.

201-4.13 ACCEPTANCE TESTING OF BITUMINOUS MIXES FOR DENSITY

Delete this entire section and insert the following:

“201-4.13 Acceptance Testing of Bituminous Mixes for Density.

After the completion of compaction, the pavement will be tested and accepted on the basis of percent air voids in the final compacted mat. The Bituminous Base Course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required.

Two random nuclear density tests shall be taken for each 500 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. The Resident Engineer shall have a nuclear guage and qualified operator on the project when constructing this item. One random mix sample shall be taken from each 1,000 tons of mix laid, for Marshall, Extraction, Maximum Specific Gravity and Air Void tests.”

201-4.15 SAMPLING PAVEMENT

Delete this section.

CHECK SHEET #11

201-6.1 Payment will be made under:

Item AR201610 -- Bituminous Base Course -- per ton.

Item AR201620 -- Bituminous Base Course, Leveling -- per ton.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201002 BITUMINOUS BASE COURSE – METHOD II
(Over 2,500 tons/pay item/location)

Effective: January 1, 2003

This Special Provision Modifies Item 201 Bituminous Base Course of the Standard Specifications.

201-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the bituminous base course.”

“The bituminous base course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

201-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, or recyclable asphalt pavement (RAP), blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Recyclable Asphalt Pavement (RAP): Recyclable asphalt pavement shall be defined as the product resulting from milling and/or crushing of bituminous concrete pavement composed of aggregates and asphalt that originally met the quality requirements as stated herein. The Contractor shall furnish evidence satisfactory to the Division and the FAA that the material met the specified quality requirements.

CHECK SHEET #12

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

201-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:
“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	20
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	4.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	8.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>10.0</i>

Delete the second and third paragraphs.

201-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:
“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and

alumino-silicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

- [1] Fine aggregate shall not contain more than 3 percent clay (2 micron or smaller) particles.
[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

201-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.

201-2.1(d) Sources of Aggregates

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the bituminous base course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways Source Certification Program. The Engineer reserves the right to inspect the source(s) and manufacturing of all

CHECK SHEET #12

aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

201-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

“Once the source(s) of the aggregates have been approved by the Engineer, the Contractor shall furnish to the Engineer the quarry quality control gradations and the gradations of stockpile samples obtained for the purpose of performing the mix design.”

201-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.”

201-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Engineer is responsible for the job mix formula (JMF) and no bituminous mixture for payment shall be produced until the approved JMF is submitted to the Contractor in writing by the Project Engineer. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, pursuant to completion of the JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”*

Delete the third paragraph and replace with the following:

“The bituminous mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	2-4	2-3
Voids filled with asphalt (%)	75-90	75-90

- [1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the Job Mix Formula. The exact amount of stone sand will be determined by the Engineer based on preparation of the Mix Design.

Delete Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Add the following sentence to the end of the fifth paragraph:

“When approved by the Engineer, the Contractor may add up to 25 percent of recyclable asphalt pavement to meet the required gradations, provided he can produce a consistent mixture meeting the mix design, temperature, and density requirements specified herein.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and the asphalt content. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”* These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

201-3.4 TEST SECTION

Delete this entire section and replace with the following:

“Prior to the manufacture of mix for the test section, Contractor quality control personnel shall have completed all proportioning and testing in accordance with Policy Memorandum 96-2, to assure that the mix produced will meet the JMF. The Contractor shall then prepare a quantity of bituminous base course mixture in order to construct the test section.

The test section shall have a length of approximately 200 to 300 lineal feet and shall be of the same depth specified for the construction of the course which it represents. The Contractor may place up to 50 tons of mix prior to construction of the test section in order to line-out the plant, the mix, and the paving operation. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented.

A. Construction of the Test Section:

The test section shall consist of two (2) parts: Development of a Growth Curve and establishing a Rolling Pattern.

CHECK SHEET #12

1. Growth Curve

To construct the Growth Curve a self-propelled vibratory roller meeting the following minimum requirements shall be required:

Drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM) minimum, unit static force on vibrating drum(s) 125 pounds per lineal inch (PLI), total applied force 325 pounds per inch (PLI), adjustable eccentrics, reversible eccentrics on nondriven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller. The vibratory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used when necessary to wet the drum to prevent the bituminous mixture from sticking.

The contractor shall have a vibrating reed tachometer (hand type) at the job site for checking roller vibrations. The reed tachometer shall have a range of 1000 to 4000 vibrations per minute (vpm). The vibrating reed tachometer shall have two (2) rows of reeds. One row shall range from 1000 to 2000 vpm and the other row shall range from 2000 to 4000 vpm.

The Growth Curve shall be constructed by successive passes of the vibratory roller, in a given area, in order to determine the maximum compactibility of the mix. More than one Growth Curve may be required as part of the test section if adjustments to the mix, plant operation, laydown, etc., are necessary to reach optimum compactability.

2. Rolling Pattern

The Contractor shall then proceed to establish the Rolling Pattern using the equipment that he intends to use for compacting the rest of the bituminous course.

B. Test Section Acceptance

The Test Section shall be evaluated and approved based on the following:

1. The completed Test Section (Rolling Pattern area) shall be divided into four (4) subsections with one (1) sample two (2) cores obtained from each subsection for determination of density. One additional core sample shall be obtained from the Growth Curve.
2. The Contractor shall correlate a nuclear density gauge to the Test Section for Quality Control testing. The nuclear density gauge shall not be used for acceptance testing.

3. The completed Test Section (rolling pattern area) shall have a minimum density of 94 percent (6 percent air voids) of the maximum theoretical specific gravity of the mix (ASTM D2041).
4. If the test section fails to meet these requirements, the Contractor shall construct a new Test Section meeting these requirements at his own expense.
5. Full production shall not be allowed until all tests, Reflux extraction or Ignition Oven, Gradation, Marshall Stability and Flow, Gravities of mix, and Core Densities are completed in order to determine compliance with these specifications.
6. The completed Test Section(s) shall be part of the proposed work. When recommended by the Resident Engineer and approved by the Engineer, test sections that do not conform to the specifications shall be removed and replaced at the Contractor's expense.
7. When a Test Section passes, the Test Section tonnage shall be paid 100%.

The mix used in construction of the Test Section shall be paid for under Section 201-6.10. Construction of the Test Section shall be paid for under Section 201-6.30.

201-4.2 BITUMINOUS MIXING PLANT

Insert the following as the first paragraph:

"The bituminous hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I bituminous mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling."

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

"The Contractor or producer shall provide a testing laboratory, meeting the requirements of IDOA's latest *Policy Memorandum 96-2: "Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures"* for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested."

201-4.3 HAULING EQUIPMENT

ADD: All trucks used for hauling bituminous mixtures shall have a tightly closing tailgate to prevent spilling of material on airfield pavements or entrance roads used for haul roads. Prior to leaving the placing site, the end of the truck beds shall be cleaned of all loose material which may spill onto the pavements and the tail gate shall be secured.

201-4.4 BITUMINOUS PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

201-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the base course aggregate(s) shall be screened into at least four sizes. This requirement does not apply to drum mixer plants.”

201-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following to the end of the third paragraph:

“The Engineer may increase the asphalt content of the first lift by up to 0.3 percent when the bituminous mixture is placed directly on a prepared subgrade.”

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the bituminous base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline

and matching shoe shall be used to pave all remaining lanes of the first lift of base course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

201-4.10 COMPACTION OF MIXTURE

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

201-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in the most recent issue of the N.A.P.A. *Superintendent’s Manual* on compaction of asphalt pavements.

201-4.13 ACCEPTANCE TESTING OF BITUMINOUS MIXES FOR DENSITY

Delete this entire section and insert the following:

“201-4.13 Acceptance Testing of Bituminous Mixes for Density

After the compaction is completed, the pavement will be tested and payment made on the basis of percent air voids in the final compacted mat.

The bituminous base course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the maximum theoretical specific gravity (ASTM D2041) and accepted by the following statistical procedure. When more than one base course mix design is used on the same project, each mix will be evaluated separately under the statistical acceptance procedure specified herein.

(a) Lot Size. The plant-produced mixture shall be tested on a lot basis. A lot shall consist of 4 sublots. End or final lots may contain between 3 and 6 sublots.

(1) A subplot shall consist of 500 tons for each type of mix.

One density sample shall be taken randomly from each subplot. Each density sample shall be the average of two cores extracted from the sample location.

CHECK SHEET #12

The Contractor shall take one random mix sample from each 1,000 tons of mix laid. This sample shall be split into two samples with one half tested by the Contractor for Marshall, Extraction or Ignition oven for Gradation and Nuclear Asphalt Gauge for asphalt content, Maximum Specific Gravity, Gradation, and Air Void tests. The other sample half shall be appropriately marked and retained by the Contractor until the Engineer requests the mix for testing or directs the Contractor in writing to dispose of the mix. All tests shall be completed and reported to the Engineer no later than the morning of the day following production.”

- (b) Lot Early Termination. When less than 3 sublots are produced, such as at the end of construction of the base course or at the end of the construction season, the final subplot data shall be included with the previous lot for payment. The final lot may thus contain up to six (6) sublots.
- (c) Acceptance Criteria. The acceptance of each lot of bituminous base course shall be based on the **Percentage of material Within specification Limits (PWL)**. The PWL is determined using standard statistical techniques and involves the number of tests in each lot (n) and the quality indexes (QL is the Quality Index for the lower limit; QU is the Quality Index for the upper limit). The quality indexes are calculated using the following formulae:

$$Q_L = \frac{\bar{X} - 1}{S} \quad Q_U = \frac{7 - \bar{X}}{S}$$

Where Q = Quality Index (lower or upper)

\bar{X} = Mean (average) value of air voids in percent

% Air Voids = (100-% density)

S = Standard Deviation of test results

For mat in-place air voids, estimate the **Percentage Within Tolerance (PWT)** for the lower and upper tolerance limits by entering Table 8 with Q_L and Q_U using the column appropriate to the total number (n) of core samples. The total percent of material between the lower and upper limits is defined as the **Percent Within Limits** and is calculated by the following formula:

$$PWL = [PWT(lower) + PWT(upper)] - 100$$

Each lot of bituminous material shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When the PWL is below 90 percent for a given lot, the lot tonnage shall be adjusted in accordance with Table 7.

TABLE 7 - PAY ADJUSTMENT SCHEDULE (see note 2.)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	1.

1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.
 2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.
- (d) Mix sampling All mix sampling shall be done on a random basis as determined by the Resident Engineer. Samples that are obviously defective or become defective prior to testing shall be discarded and retaken. New samples shall be considered as if they were initial samples.

201-4.15 SAMPLING PAVEMENT

Delete this section and replace with the following:

201-4.15 Sampling Pavement Cores from each subplot shall be taken at random locations as outlined by the Resident Engineer. No core samples shall be taken within two feet of the edge of pavement. Any core less than 1-1/2 inch thickness shall not be used and a new location and sample shall be selected.

Core samples of approximately 4 inches in diameter, for determination of in-place air voids of the completed pavement, shall be obtained by the Contractor at no extra expense. The number and locations of the samples shall be as determined by the Resident Engineer. The Contractor shall furnish all tools, labor, and materials for sampling and replacing pavement.

All core tests necessary to determine initial conformance with specification requirements will be performed by the Resident Engineer at no cost to the Contractor.

- (a) Resampling and Retesting Resampling of a lot may be allowed only under the following conditions:
 - (1) The Contractor must request, in writing, the resampling and retesting of a complete lot within 48 hours after receiving the written test

CHECK SHEET #12

results of the lot from the Resident Engineer. Only one retest per lot will be permitted.

- (2) If the retested lot should result in a higher "Percent Within Limits" figure than the original, based on all lot samples (original and new) the following will apply:
 - (a) The cost of resampling and retesting will be borne by the Engineer.
 - (b) The new "Percent Within Limits" figure shall be calculated using all LOT samples, (original and new) for calculating the lot payment.
- (3) If the retested lot should result in a "Percent Within Limits" figure equal to or less than the original, based on all the lot samples (original and new), the following will apply:
 - (a) The cost of resampling and retesting will be borne by the Contractor.
 - (b) The new "Percent Within Limits" figure shall be calculated using all lot samples, (original and new) for calculating the lot payment.
- (4) Procedures in ASTM E-178 shall be used to determine outliers based on all samples taken and a 5% significance level.
- (5) Results of the retesting and resampling shall be final."

201-6.1 BASIS OF PAYMENT

Delete this section and replace with the following:

"201-6.1 Basis of Payment The quantity of bituminous base course mixture measured as outlined in Section 201-5.1 shall be adjusted in accordance with Section 201-4.13 herein. Payment shall be calculated by multiplying the contract unit price per ton of bituminous base course and the adjusted tons per lot. Final payment shall be compensation for furnishing all materials, for all preparation, mixing, testing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

The test section shall be paid for at the contract unit price per each, which price shall include the additional specified equipment, labor, Engineering, and testing time necessary to construct this item.

Payment will be made under:

- Item AR201610 -- Bituminous Base Course -- per ton.
- Item AR201620 -- Bituminous Base Course, Leveling -- per ton.
- Item AR201630 -- Bituminous Base Test Section -- per each.

TABLE 8
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX (QL or QU)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789	1.0788	1.0787
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382	1.0377	1.0374
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990	0.9982	0.9976
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643	0.9624	0.9610	0.9599	0.9591
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241	0.9228	0.9219
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882	0.8868	0.8857
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533	0.8517	0.8505
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192	0.8175	0.8161
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858	0.7840	0.7826
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531	0.7513	0.7498
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211	0.7192	0.7177
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896	0.6877	0.6861
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587	0.6567	0.6551
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282	0.6262	0.6247
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982	0.5962	0.5947
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686	0.5667	0.5651
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454	0.5419	0.5394	0.5375	0.5360
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105	0.5086	0.5072
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820	0.4802	0.4787
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537	0.4520	0.4506
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310	0.4280	0.4257	0.4241	0.4227
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031	0.4001	0.3980	0.3964	0.3951
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705	0.3690	0.3678
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432	0.3418	0.3407
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161	0.3148	0.3137
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892	0.2880	0.2870
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624	0.2613	0.2604

CHECK SHEET #12

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358	0.2348	0.2339
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2083	0.2084	0.2076
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829	0.1821	0.1814
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566	0.1559	0.1553
55	0.1806	0.1500	0.1406	0.1353	0.1338	0.1322	0.1312	0.1304	0.1298	0.1293
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1048	0.1042	0.1038	0.1034
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792	0.0786	0.0781	0.0778	0.0775
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521	0.0518	0.0516
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260	0.0259	0.0258
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260	-0.0259	-0.0258
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521	-0.0518	-0.0516
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781	-0.0778	-0.0775
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1048	-0.1042	-0.1038	-0.1034
45	-0.1806	-0.1500	-0.1406	-0.1353	-0.1338	-0.1322	-0.1312	-0.1304	-0.1298	-0.1293
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566	-0.1559	-0.1553
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829	-0.1821	-0.1814
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2083	-0.2084	-0.2076
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358	-0.2348	-0.2339
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624	-0.2613	-0.2604
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892	-0.2880	-0.2870
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161	-0.3148	-0.3137
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432	-0.3418	-0.3407
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705	-0.3690	-0.3678
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980	-0.3964	-0.3951
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4354	-0.4310	-0.4280	-0.4257	-0.4241	-0.4227
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537	-0.4520	-0.4506
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820	-0.4802	-0.4787
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105	-0.5087	-0.5072
30	-0.6787	-0.6000	-0.5719	-0.5583	-0.5504	-0.5454	-0.5419	-0.5394	-0.5375	-0.5360
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686	-0.5667	-0.5651
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982	-0.5962	-0.5947
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282	-0.6262	-0.6217
26	-0.7904	-0.7200	-0.6920	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587	-0.6567	-0.6551
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896	-0.6876	-0.6861
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211	-0.7192	-0.7177
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531	-0.7513	-0.7498
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858	-0.7840	-0.7826
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8246	-0.8214	-0.8192	-0.8174	-0.8161
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533	-0.8517	-0.8505

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882	-0.8868	-0.8057
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241	-0.9228	-0.9219
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610	-0.9599	-0.9591
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990	-0.9982	-0.9976
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382	-1.0377	-1.0374
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789	-1.0788	-1.0787
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212	-1.1215	-1.1217
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653	-1.1661	-1.1668
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115	-1.2129	-1.2141
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602	-1.2623	-1.2640
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118	-1.3148	-1.3172
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670	-1.3709	-1.3741
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265	-1.4316	-1.4358
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4716	-1.4829	-1.4914	-1.4981	-1.5035
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635	-1.5721	-1.5790
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5872	-1.6127	-1.6313	-1.6454	-1.6566	-1.6655
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6992	-1.7235	-1.7420	-1.7566	-1.7684
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8054	-1.8379	-1.8630	-1.8828	-1.8989
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362	-2.0657	-2.0897

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR201661 CLEAN & SEAL BITUMINOUS CRACKS

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of cleaning, routing, and sealing designated joints and cracks in existing bituminous pavements. This work shall include the proper routing and/or cleaning of all cracks to be sealed and furnishing and installing hot pour crack sealer in accordance with these specifications. Wherever the word "cracks" is used, it shall be construed to mean cracks to be sealed.

MATERIALS

2.1 GENERAL

All materials proposed for use shall be approved prior to installation.

2.2 CRACK SEALANT

The crack sealant shall meet the requirements of ASTM D-3405.

2.3 BACKER ROD

Backer rod shall be a closed cell non-absorptive polyolefin material compatible with hot pour. Backer rod shall be of sufficient diameter to be compressed in the routed crack or joint.

EQUIPMENT

3.1 GENERAL

All machines, tools and equipment used in the performance of work required by these specifications will be subject to approval and maintained in a satisfactory working condition at all times.

3.2 CRACK ROUTING/CLEANING MACHINE

The crack routing machine shall be portable and capable of routing existing bituminous surfaces along and adjacent to the crack. The unit shall be capable of following random cracks. The unit shall have an adjustable depth control and be capable of cutting width modification. The machine shall be

capable of routing cracks to sufficient depths for installation of a backer rod and joint sealant in accordance with the details in the attachments.

CONSTRUCTION METHODS

4.1 PREPARATION OF CRACKS

General: The cracks shall be routed and/or cleaned to provide a sealant reservoir of a width to depth ratio of 1:1 with a minimum width of 3/8" and a depth equal to the width plus 1/4". No crack sealer material shall be placed until the cracks have been cleaned of all loose dirt and material. Following the initial routing and cleaning operation, all cracks will be blown out with compressed air. The cracks shall be inspected and approved prior to placing the sealer material. Any and all loose materials shall be disposed of by the Contractor off site. Contractor shall use any combination of joint/crack rakes, plows, routers, wire wheels and air compressors to clean the crack/joint of all laitance, sealant debris and dust film.

Crack/Joint Sealing (5/8" to 1" Wide): Cracks and joints in this width range shall be cleaned of all dirt, existing sealant and debris to a depth sufficient to allow for a backer rod and the new joint sealant at the thickness specified in paragraph 4-4.2.

Crack/Joint Sealing (3/8" to 5/8" Wide): These cracks and joints shall be cleaned of all dirt, debris, and old sealant. Routing shall be as necessary to shape the sealant reservoir and provide adequate depth for backer rod and sealant.

Crack/Joint Sealing (Less Than 3/8" Wide): These cracks and joints shall be routed to a minimum of 3/8" wide and to a sufficient depth to provide the backer rod and joint sealant. The routed reservoir shall be cleaned and sealed.

4.2 APPLICATION OF CRACK SEALING MATERIAL

Final cleaning will not proceed in advance of sealing by more than one (1) working day, except as otherwise approved by the Resident Engineer.

The crack routing shall provide a width to depth ratio of 1:1 for sealant material.

The crack sealant shall be applied uniformly solid from bottom to top and shall be filled without formation of entrapped air or voids. The heating kettle shall be an indirect heating type, constructed as a double boiler. A positive temperature control and mechanical agitation shall be provided. The sealant shall not be heated to more than 20°F above the safe heating temperature. The safe heating temperature can be obtained from the manufacturer's shipping container. A direct connecting pressure type extruding device with nozzles shaped for insertion into the joint shall be provided. Sealing material should be used sparingly. Only enough material shall be poured

CHECK SHEET #13

into the opening to fill the crevice to within 1/4" of the pavement surface. Overfilling will not be permitted.

METHOD OF MEASUREMENT

- 5.1 The linear feet of cleaning and sealing of cracks to be paid for shall be the number of linear feet of each crack or joint routed, cleaned, sealed and accepted as complete. Measurement of linear feet of crack cleaning and sealing for payment shall be to the nearest foot.

BASIS OF PAYMENT

- 6.1 This item will be paid for at the contract unit price per linear foot of cleaning and sealing cracks in the pavement, complete; which price and payment shall constitute full compensation for all routing, cleaning, preparation and disposal of all loose materials; and for all materials, labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

Item AR201661 -- Clean & Seal Bituminous Cracks -- per linear foot.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201663 SAND MIX CRACK REPAIR

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of cleaning out designated cracks of 1" minimum width and placement and compaction of a bituminous sand mix in the void. Locations for the sand mix bituminous crack repair shall be designated by the Resident Engineer. Wherever the word "cracks" is used, it shall be construed to mean the cracks or joints to be sealed.

MATERIALS

2.1 CRACK/JOINT FILLER

Bituminous sand mix shall conform to the following requirements:

Sieve	% Passing
3/8"	100
No. 4	94 - 100
No. 16	45 - 85
No. 50	10 - 30
No. 100	0 - 10
(IDOT FA-2)	
Asphalt	4 - 7

The ingredients shall be heated and combined in such a manner as to produce a bituminous mixture which when discharged from the mixer shall not be more than 350°F.

EQUIPMENT

3.1 CRACK CLEANING EQUIPMENT

The crack cleaning equipment shall consist of hand tools, compressors and nozzles with sufficient air pressure to dislodge dirt, laitance and loose bituminous material and rock to prepare the crack for sealing. All machines, tools, equipment and methods used in the performance of work required by these specifications will be subject to the approval of the Engineer and Owner. The equipment or method used shall result in no damage to existing surfaces. Prior to placement of the bituminous mixture the cracks and joints

CHECK SHEET #14

shall be blown out with compressed air at a pressure of at least 90 psi with 150 cubic feet per minute at the nozzle.

CONSTRUCTION METHODS

4.1 PREPARATION OF CRACKS

No crack filler material shall be placed until the cracks have been cleaned of all loose dirt, joint material and debris.

A tack coat shall be applied to the cleaned joint prior to installation of the sand mix.

Cleaning will not proceed in advance of filling by more than one (1) working day, except as otherwise approved by the Resident Engineer.

The crack shall be filled with the bituminous mixture and the top lift compacted with a self-propelled vibratory "pup" roller or other means approved by the Resident Engineer.

Mixture shall be placed in maximum 3" lifts and compacted by approved hand tools.

Mixture for cracks and joints delivered to the work site which has cooled to 200°F shall be considered unsatisfactory to the work and shall not be used.

METHOD OF MEASUREMENT

- 5.1 The linear feet of bituminous crack filler to be paid for shall be the number of linear feet of cracks cleaned and filled as specified in the plans and as directed by the Resident Engineer and accepted by the Engineer.

BASIS OF PAYMENT

- 6.1 This item will be paid for at the contract unit price per linear foot of sand mix crack repair, which price and payment shall constitute full compensation for all cleaning, preparation and disposal of all loose materials; and for all materials, labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

Item AR201663 -- Sand Mix Crack Repair -- per linear foot.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR201671 CRACK CONTROL FABRIC

Effective: January 1, 2003

DESCRIPTION

- 1.1 This work shall consist of constructing reflective crack control treatment of the type shown on the plans. This work shall be performed in accordance with the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

MATERIALS

- 2.1 Reflective Crack Control System A. The reinforcing fabric shall be a nonwoven polypropylene or other approved plastic fabric having the following properties:

Weight (ASTM D 3776) oz./sq. yd. (g/m ²), min.	4.0 (135)
Grab Tensile Strength (ASTM D 4632) lbs. (N), min.	90.0 (400)
Grab Elongation at Break (ASTM D 4632) %, min-max.	40-100
Asphalt Retention gals./sq. yd. (L/m ²), min.	0.20 (0.9)

The asphalt binder shall be AC 10 or AC 20 meeting the requirements of ASTM D3381.

- 2.2 Reflective Crack Control System B. Waterproofing membrane interlayer shall incorporate a high strength fabric embedded in a layer of self-adhesive suitably plasticized bitumen with the following properties:

<u>Property</u>	<u>Value</u>	<u>Test Method</u>
Thickness	0.065 inch (1.65 mm), min.	
Permeance-Perms	0.10 (1.0) max	ASTM E 96 Procedure B
Tensile Strength	50 lb./in. (8.7 N/mm), min.	ASTM D 882 (modified for 25 mm (1") opening)
Puncture Resistance (fabric)	200 lbs. (90 kg), min.	ASTM E 154
Pliability -12.7 mm (-1/2 inch)-mandrel	No cracks in fabric or plasticized bitumen	ASTM D 146

CONSTRUCTION METHODS

- 3.1 This work shall be performed in accordance with the Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

METHOD OF MEASUREMENT

- 4.1 Crack control fabric will be measured in place and the area computed in square yards.

BASIS OF PAYMENT

- 5.1 This work shall be paid for at the contract unit price per square yard for Crack Control Fabric. This price shall be payment for completing all work.

Payment will be made under:

Item AR201670 -- Crack Control Fabric -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR302000 ASPHALT TREATED PERMEABLE SUBBASE
(Central Plant Hot Mix)

Effective: January 1, 2003

DESCRIPTION

- 1.1 The work shall consist of an asphalt treated permeable subbase composed of crushed granular materials stabilized with an asphalt binder constructed on a prepared subgrade or subbase in accordance with these specifications, and in conformity with the dimensions and typical cross sections shown on the plans, and to the lines and grades established by the Engineer.

The contractor shall be responsible for the quality control in the production and construction of the ATPS.

MATERIALS

2.1 AGGREGATE

Aggregate shall be crushed gravel or crushed stone as defined below:

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

2.2 BITUMINOUS MATERIAL

The bituminous material for the APTS shall be PG 58-22.

COMPOSITION

3.1 JOB MIX FORMULA (JMF)

The sources of materials used for establishing the approved JMF shall be selected by the contractor and submitted in writing to the Engineer for approval. The contractor shall indicate the producer name, producer location, IDOT producer/supplier number, and IDOT material code number, for all proposed aggregates, asphalt cements, and anti-strip additives to be used. No bituminous mixture for pavement shall be produced until a JMF has been approved and issued by the Engineer. The JMF shall indicate the definite percentage of each sieve fraction of aggregate, the percentage of bitumen, and the recommended temperature of the completed mixture when discharged from the mixer. A minimum of four (4) hours before the production of any mix, the contractor shall provide access to the plant by the Resident Engineer and Quality Control Manager in order to set up the mix. Should there be a change in sources of materials, a new JMF shall be established before the new materials are used.

The bituminous mixture shall be a combination of the specified aggregate gradation and asphalt cement as stated herein:

Requirements for Gradation of Aggregates

Sieve	% Passing (by weight) (IDOT CA-11)
1 inch	100
¾ inch	84-100
½ inch	30-60
No. 4	0-12
No. 16	0-6
Asphalt Cement	2.0-3.0

The Engineer shall establish the percent of asphalt cement to be used. The contractor shall use an approved heat-stable anti-strip additive. The anti-strip additive shall be added to the asphalt tank at the dosage of 1.0 percent by weight of asphalt cement and shall be thoroughly mixed by circulation of the asphalt for at least 4 hours prior to being incorporated into the mix. An

in-line blender may be used as an alternative to the procedure described above.

3.2 TEST SECTION

Prior to full production, the contractor shall prepare a quantity of bituminous mixture according to the approved JMF. The amount of mixture should be sufficient to construct a test section of at least 400 square yards and shall be of the same depth for the construction of the course which it represents. The underlying grade or pavement structure upon which the test section is to be constructed, shall be the same as the remainder of the course represented by the test section. The underlying grade or pavement structure shall be prepared with a bituminous tack coat in accordance with item 603 of these Special Provisions.

The test section may remain as part of the proposed work if approved by the Engineer. A mix sample shall be taken and tested using the IDOT approved Ignition Method for Determining Asphalt Content. The tests shall be completed and the results reported to the Engineer. The gradation and asphalt content must meet the JMF within the minimum and maximum percentages specified on the JMF. Production paving of the ATPS mixture may continue past the limits of the test section when final approval is given by the Engineer. If the test section should prove to be unsatisfactory, the necessary adjustments to the mix design, plant operations, and/or rolling procedures shall be implemented. Additional test sections, as required, shall be constructed and evaluated for conformance to the specifications. When test sections do not conform to the specification requirements, the pavement shall be removed and replaced at the contractor's expense.

3.3 WEATHER LIMITATIONS

The bituminous mixture shall not be placed during foggy, windy (> 15 mph), and/or rainy weather. The ambient air temperature must be 60°F and rising two days before and the day of paving. The bituminous mixture shall not be placed on a wet surface or when the surface temperature of the underlying course is less than that specified below.

Mat Thickness	Base Temperature °F
3" or greater	40
< 3", but > 1"	45

3.4 BITUMINOUS MIXING PLANT

The ATPS, hot mix asphalt shall be manufactured in a bituminous plant that has been calibrated and approved in accordance with 1102 of the current Standard Specifications for Road and Bridge Construction by the IDOT Division of Highways for the manufacture of Class I mixtures.

3.5 HAULING EQUIPMENT

Vehicles used in transporting the bituminous mixtures shall have clean and tight beds. The beds shall be sprayed with asphalt release agents which have been tested and approved for use by the Department. After spraying, the bed of the vehicle shall be in a completely raised position and it shall remain in this position until all excess asphalt release agent has been drained. When the air temperature is below 60°F, the bed, including the end, endgate, sides and bottom shall be insulated with fiberboard, plywood or other approved insulating material and shall have a thickness of not less than ¾ inch. When the insulation is placed inside the bed, the insulation shall be covered with sheet steel approved by the Engineer. Each vehicle shall be equipped with a cover of canvas or other suitable material meeting the approval of the Engineer which shall be used if any one of the following conditions are present:

- (a) Ambient air temperature is below 60°F.
- (b) The weather is inclement (such as rainy or foggy conditions as determined by the Resident Engineer).
- (c) The temperature of the bituminous mixture immediately behind the paver screed is below 250 °F.

3.6 BITUMINOUS PAVERS

Bituminous pavers shall meet the requirements of Section 201-4.4 of the Standard Specifications for Construction of Airports except as modified herein.

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 vpm”

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjusted screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.

Delete the second sentence of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

3.7 ROLLERS

A steel wheel tandem roller weighing not less than 8 tons nor more than 12 tons and having a unit compression on the drive wheels of not less than 250 nor more than 400 pounds per inch of roller width, shall be used to compact the mix.

3.8 PREPARATION OF THE BITUMINOUS MATERIAL

The bituminous material shall be heated to the specified temperature in a manner that will avoid local overheating and provide a continuous supply of asphalt cement material to the mixer at a uniform temperature. The temperature of the asphalt cement material delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 300 °F.

3.9 PREPARATION OF BITUMINOUS MIXTURE

The aggregates and the asphalt cement material shall be measured or gauged and introduced into the mixer in the amount specified by the JMF.

The temperature of the aggregate before adding the asphalt cement shall not be less than 250°F nor more than 350°F unless authorized by the Engineer. The combined materials shall be mixed until a complete uniform coating of the particles and a thorough distribution of the asphalt cement throughout the aggregate are secured. Wet mixing time shall be approved by the Engineer for each plant and each type of aggregate used. Normally, the mixing time after introduction of asphalt cement should not be less than 30 seconds.

3.10 TRANSPORTING, SPREADING AND FINISHING

The mixture shall be transported from the mixing plant to the job site in vehicles conforming to the requirements of 4.3. Deliveries shall be scheduled so that paving and rolling of all mixture prepared for one day's run can be completed during the day light unless adequate artificial lighting is provided. Hauling over freshly laid material shall not be permitted until the material has been compacted, as specified, allowed to cool to atmospheric temperature, and approval is received from the Resident Engineer.

Immediately before placing the bituminous mixture, the underlying course shall be cleaned of all loose or deleterious material with power blowers, power brooms or hand brooms as directed.

The mixture shall be placed at a temperature of not less than 250°F. The moisture content of the mixture shall not exceed 0.5 percent.

The mixture shall be spread to the width specified in the plans by an approved bituminous paver. It shall be struck off in a uniform layer of such depth that, when the work is completed, it shall have the specified thickness and shall conform to the grade and contours specified in the plans. The speed of the paver shall be regulated to eliminate pulling and tearing of the mat. Placing shall begin along the centerline of areas to be paved on a crowned section or on the high side of areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10 feet, except where edge lanes require strips less than 10 feet to complete the area.

Transverse joints in adjacent lanes shall be offset a minimum of ten (10) feet.

In areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread raked and luted using hand tool methods.

The first lane of the ATPS shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and a matching shoe shall be used to pave all remaining lanes of the ATPS.

3.11 COMPACTION OF MIXTURE

After spreading, the mixture shall be thoroughly and uniformly compacted using approved rollers. Three(3) or four(4) complete passes should be sufficient to compact the mixture however, compaction shall be to the satisfaction of the Engineer. Rolling will be withheld until the mixture has cooled to approximately 150°F. Rolling shall be initiated with the drive wheel toward the paving machine. The sequence of rolling for the first paving lane shall be to first roll the lower edge (with reference to the transverse slope of the lane) and then roll the upper edge. The interior of the lane should then be rolled from the lower side toward the upper with overlapping roller paths. On adjoining paving lanes, rolling shall begin by starting 6 to 8 inches from the longitudinal joint and then overlapping the joint on the second pass (pinching).

The speed of the roller shall at all times be sufficiently slow to avoid displacement of the hot mixture. The rollers shall not travel faster than the manufacturer's recommended speed and in no case faster than 3 mph. Any displacement occurring as a result of reversing the direction of the roller or from any other cause, shall be corrected at once by rakes and fresh mixture. The roller shall not be permitted to stand static on the hot material.

Sufficient rollers shall be furnished to handle the output of the plant. The contractor shall take measures in order to prevent mix from adhering to the rollers during the rolling operations.

In areas not accessible to the rollers, the mix shall be compacted with hand tampers.

Any mixture which becomes loose and broken, mixed with dirt, or in any way defective shall be removed and replaced with fresh, hot mixture and immediately compacted to conform to the surrounding area. After compaction and acceptance of the ATPS, the contractor shall protect the surface from all damage and/or contamination. If at any time prior to placement of the succeeding pavement course, the integrity of the ATPS is disturbed, the effected area shall be removed and immediately replaced at the Contractor's expense.

3.12 JOINTS

The formation of all joints shall be made in such a manner (approved by the Resident Engineer) as to ensure a continuous bond between old and new sections of the course.

The roller shall not pass over the unprotected end of the freshly laid mixture except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course, in which case the edge shall be cut back to its full depth and width to expose a vertical face. In both cases, all contact surfaces shall be given a tack coat of bituminous material prior to placing any fresh mixture against the joint. Longitudinal joints which are damaged, or otherwise defective, shall be cut back to expose a clean, sound vertical face for the full depth of the course. All repaired contact surfaces shall be given a tack coat of bituminous material prior to placing any fresh mixture against the joint.

3.13 SHAPING EDGES

While the surface is being compacted and finished, the contractor shall carefully trim the outside edges of the pavement to the proper alignment. Edges so formed, shall be beveled while still hot with the back of a rake or lute.

3.13 SURFACE TESTS

The finished surface shall not vary more than 3/16 inch when tested with a 16 foot straight edge applied parallel with, or at right angles to, the centerline. ATPS with a surface higher than .02 foot above the proposed grade shall be removed and replaced at the contractor's expense with ATPS which complies with these specifications. When permitted by the Engineer, the high spots may be removed to within specified tolerances by any method that does not produce contaminating fines nor damage the ATPS to remain in place. Grinding will not be permitted.

Finished ATPS with a surface lower than .05 foot below the grade specified shall be removed and replaced with ATPS at the Contractor's expense.

METHOD OF MEASUREMENT

- 4.1 The area of asphalt treated permeable subbase shall be the square yards asphalt treated treated permeable subbase completed and accepted by the Engineer.

BASIS OF PAYMENT

- 5.1 Payment shall be made at the contract unit price per square yard for asphalt treated permeable subbase and at the contract unit price per each for ATPS test section. These prices shall be full compensation for furnishing all materials, labor, equipment and any incidentals necessary to complete item as shown on the plans and specified herein.

Payment will be made under:

Item AR302611 -- Asphalt Treated Permeable Subbase -- per square yard.
Item AR302630 -- ATPS Test Section -- per each.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401001 BITUMINOUS SURFACE COURSE – METHOD I
(Under 2,500 tons/pay item/location)

Effective: January 1, 2003

This Special Provision Modifies Item 401 Bituminous Surface Course of the Standard Specifications.

401-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the bituminous surface course.”

“The bituminous surface course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

401-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the

CHECK SHEET #17

No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

401-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:
“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Delete the second and third paragraphs.

401-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:
“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

401-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.”

401-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the bituminous surface course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways source certification program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

401-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

“Once the source(s) of the aggregates have been approved by the Engineer, the Contractor shall furnish to the Engineer the quarry quality control gradations and the gradations of stockpile samples obtained for the purpose of performing the mix design.”

401-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.

401-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Engineer is responsible for the job mix formula (JMF) and no bituminous mixture for payment shall be produced until the approved JMF is submitted to the Contractor in writing by the Project Engineer. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, pursuant to completion of the JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”*

Delete the third paragraph and replace with the following:

“The bituminous mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	2-4	2-3
Voids filled with asphalt (%)	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the Job Mix Formula. The exact amount of stone sand will be determined by the Engineer based on preparation of the Mix Design.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”* These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

401-3.4 TEST SECTION

Delete this section.

401-4.2 BITUMINOUS MIXING PLANT

Insert the following as the first paragraph:

“The bituminous hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I bituminous mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of IDOA’s latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures”* for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

401-4.4 BITUMINOUS PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are

bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

401-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the surface course aggregate(s) shall be screened into at least three sizes. This requirement does not apply to drum mixer plants.”

401-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the bituminous base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane.

A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of surface course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

401-4.10 COMPACTION OF MIXTURE

Add the following to the end of the second paragraph:

“A self-propelled pneumatic -tire roller meeting the following requirements shall be required on the top lift of surface course mixture:

The roller shall be of the oscillating wheel type consisting of not less than 7 pneumatic-tired wheels revolving on 2 axles, and capable of being ballasted to the mass (weight) required. The front and rear wheels shall be staggered so that the tire sidewalls will have a minimum overlap of 1/2 inch. The roller shall provide for a smooth operation when starting, stopping or reversing direction. The tires shall withstand inflation pressures between 60 and 120 psi. The roller shall be equipped with an adequate scraping or cleaning device on each tire to prevent the accumulation of material on the tires.

When used for the compaction of bituminous mixtures, the roller shall be equipped with a water system which will keep all tires uniformly wet to prevent material pickup. The contractor shall provide means for determining the mass (weight) of the roller as distributed on each wheel. Ballast shall be included in determining the mass (weight)."

Delete the third paragraph and substitute the following:

"Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein."

401-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are "pinched" to provide adequate density at the joint. The method of "pinching" shall be as defined in the most recent issue of the N.A.P.A. *Superintendent's Manual* on compaction of asphalt pavements.

401-4.13 ACCEPTANCE TESTING OF BITUMINOUS MIXES FOR DENSITY

Delete this entire Section and insert the following:

"401-4.13 Acceptance Testing of Bituminous Mixes For Density.

After the completion of compaction, the pavement will be tested and accepted on the basis of percent air voids in the final compacted mat. The Bituminous Surface Course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required. Two random nuclear density tests shall be required. Two random nuclear density shall be taken for each 500 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. One random mix sample shall be taken from each 1,000 tons of mix laid for Marshall, Extraction, Maximum Specific Gravity and Air Void tests. The Resident Engineer shall have a nuclear gauge and qualified operator on the project when constructing this item."

401-4.15 SAMPLING PAVEMENT

Delete this section.

The completed pavement shall be cleaned so that no debris or dirt from coring operations is left on the surface of the pavement.

BASIS OF PAYMENT

401-6.1 Payment will be made under:

- Item AR401610 -- Bituminous Surface Course -- per ton.
- Item AR401620 -- Bit. Surface Course, Leveling -- per ton.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401001 BITUMINOUS SURFACE COURSE – METHOD II
(Over 2,500 tons/pay item/location)

Effective: January 1, 2003

This Special Provision Modifies Item 401 Bituminous Surface Course of the Standard Specifications.

401-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the bituminous surface course.”

401-1.1 Add to the second paragraph:

“The bituminous surface course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

401-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

CHECK SHEET #18

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

401-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:
“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Delete the second and third paragraphs.

401-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:
“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the

nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

401-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.

401-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the bituminous surface course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways source certification program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

401-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

“Once the source(s) of the aggregates have been approved by the Engineer, the Contractor shall furnish to the Engineer the quarry quality control gradations and the gradations of stockpile samples obtained for the purpose of performing the mix design.”

401-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.

401-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Engineer is responsible for the job mix formula (JMF) and no bituminous mixture for payment shall be produced until the approved (JMF) is submitted to the Contractor in writing by the Project Engineer. The approved (JMF) shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, pursuant to completion of the (JMF). The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”*

Delete the third paragraph and replace with the following:

“The bituminous mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	2-4	2-3
Voids filled with asphalt (%)	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the Job Mix Formula. The exact amount of stone sand will be determined by the Engineer based on preparation of the Mix Design.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved (JMF) for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures.”* These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

401-3.4 TEST SECTION

Delete this entire section and replace with the following:

“Prior to the manufacture of mix for the test section, Contractor quality control personnel shall have completed all proportioning and testing in accordance with Policy Memorandum 96-2, to assure that the mix produced will meet the (JMF). The Contractor shall then prepare a quantity of bituminous surface course mixture in order to construct the test section.

The test section shall have a length of approximately 200 to 300 lineal feet and shall be of the same depth specified for the construction of the course which it represents. The Contractor may place up to 50 tons of mix prior to construction of the test section in order to line-out the plant, the mix, and the paving operation. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented.

A. Construction of the Test Section:

The test section shall consist of two (2) parts: Development of a Growth Curve and establishing a Rolling Pattern.

1. Growth Curve

To construct the Growth Curve a self-propelled vibratory roller meeting the following minimum requirements shall be required:

Drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM) minimum, unit static force on vibrating drum(s) 125 pounds per lineal inch (PLI), total applied force 325 pounds per inch (PLI), adjustable eccentrics, reversible eccentrics on nondriven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller. The vibratory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used when necessary to wet the drum to prevent the bituminous mixture from sticking. The

contractor shall have a vibrating reed tachometer (hand type) at the job site for checking roller vibrations. The reed tachometer shall have a range of 1000 to 4000 vibrations per minute(vpm). The vibrating reed tachometer shall have two (2) rows of reeds. One row shall range from 1000 to 2000 vpm and the other row shall range from 2000 to 4000 vpm.

The Growth Curve shall be constructed by successive passes of the vibratory roller, in a given area, in order to determine the maximum compactibility of the mix. More than one Growth Curve may be required as part of the test section if adjustments to the mix, plant operation, laydown, etc., are necessary to reach optimum compactability.

2. Rolling Pattern

The Contractor shall then proceed to establish the Rolling Pattern using the equipment that he intends to use for compacting the rest of the bituminous course.

B. Test Section Acceptance

The Test Section shall be evaluated and approved based on the following:

1. The completed Test Section (Rolling Pattern area) shall be divided into four (4) subsections with one (1) sample two(2) cores obtained from each subsection for determination of density. One additional core sample shall be obtained from the Growth Curve.
2. The Contractor shall correlate a nuclear density gauge to the Test Section for Quality Control testing. The nuclear density gauge shall not be used for acceptance testing.
3. The completed Test Section (rolling pattern area) shall have a minimum density of 94 percent (6 percent air voids) of the maximum theoretical specific gravity of the mix (ASTM D2041).
4. If the test section fails to meet these requirements, the Contractor shall construct a new Test Section meeting these requirements at his own expense.
5. Full production shall not be allowed until all tests, Reflux extraction or Ignition Oven , Gradation, Marshall Stability and Flow, Gravities of mix, and Core Densities are completed in order to determine compliance with these specifications.
6. The completed Test Section(s) shall be part of the proposed work. When recommended by the Resident Engineer and approved by the Engineer, test sections that do not conform to the specifications shall be removed and replaced at the Contractor's expense.

7. When a Test Section passes, the Test Section tonnage shall be paid 100%.

The mix used in construction of the Test Section shall be paid under Section 401-6.10. Construction of the Test Section shall be paid for under Section 401-6.30. Payment will be made for only one (1) Test Section.

401-4.2 BITUMINOUS MIXING PLANT

Insert the following as the first paragraph:

“The bituminous hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I bituminous mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of IDOA’s latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures”* for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

401-4.3 HAULING EQUIPMENT

ADD: All trucks used for hauling bituminous mixtures shall have a tightly closing tailgate to prevent spilling of material on airfield pavements or entrance roads used for haul roads. Prior to leaving the placing site, the end of the truck beds shall be cleaned of all loose material which may spill onto the pavements and the tail gate shall be secured.

401-4.4 BITUMINOUS PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the

machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

401-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the surface course aggregate(s) shall be screened into at least three sizes. This requirement does not apply to drum mixer plants.”

401-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the bituminous base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of surface course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.

401-4.10 COMPACTION OF MIXTURE

Add the following to the end of the second paragraph:

“A self-propelled pneumatic -tire roller meeting the following requirements shall be required on the top lift of surface course mixture:

The roller shall be of the oscillating wheel type consisting of not less than 7 pneumatic-tire wheels revolving on 2 axles, and capable of being ballasted to the mass (weight) required. The front and rear wheels shall be staggered so that the tire sidewalls will have a minimum overlap of 1/2 inch. The roller shall provide for a smooth operation when starting, stopping or reversing direction. The tires shall withstand inflation pressures between 60 and 120 psi. The roller shall be equipped with an adequate scraping or cleaning device on each tire to prevent the accumulation of material on the tires. When used for the compaction of bituminous mixtures, the roller shall be equipped with a water system which will keep all tires uniformly wet to prevent material pickup. The contractor shall provide means for determining

the mass (weight) of the roller as distributed on each wheel. Ballast shall be included in determining the mass (weight).”

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

401-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in the most recent issue of the N.A.P.A. *Superintendent’s Manual* on compaction of asphalt pavements.

401-4.13 ACCEPTANCE TESTING OF BITUMINOUS MIXES FOR DENSITY

Delete this entire section and insert the following:

“401-4.13 Acceptance Testing of Bituminous Mixes for Density

After the compaction is completed, the pavement will be tested and payment made on the basis of percent air voids in the final compacted mat.

The bituminous surface course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the maximum theoretical specific gravity (ASTM D2041) and accepted by the following statistical procedure. When more than one surface course mix design is used on the same project, each mix will be evaluated separately under the statistical acceptance procedure specified herein.

(a) Lot Size. The plant-produced mixture shall be tested on a lot basis. A lot shall consist of 4 sublots. End or final lots may contain between 3 and 6 sublots.

(1) A subplot shall consist of 500 tons for each type of mix.

One density sample shall be taken randomly from each subplot. Each density sample shall be the average of two cores extracted from the sample location.

The Contractor shall take one random mix sample from each 1,000 tons of mix laid. This sample shall be split into two samples with one half tested by the Contractor for Marshall, Extraction or Ignition oven for Gradation and asphalt content, Maximum Specific Gravity, Gradation, and Air Void tests. The other sample half shall be appropriately marked and retained by the

CHECK SHEET #18

Contractor until the Engineer requests the mix for testing or directs the Contractor in writing to dispose of the mix.

All tests shall be completed and reported to the Engineer no later than the morning of the day following production.”

- (b) Lot Early Termination. When less than 3 sublots are produced, such as at the end of construction of the surface course or at the end of the construction season, the final subplot data shall be included with the previous lot for payment. The final lot may thus contain up to six (6) sublots.
- (c) Acceptance Criteria. The acceptance of each lot of bituminous base course shall be based on the **Percentage of material Within specification Limits (PWL)**. The PWL is determined using standard statistical techniques and involves the number of tests in each lot (n) and the quality indexes (Q_L is the Quality Index for the lower limit; Q_U is the Quality Index for the upper limit). The quality indexes are calculated using the following formulae:

$$Q_L = \frac{\bar{X} - 1}{S} \quad Q_U = \frac{7 - \bar{X}}{S}$$

Where Q = Quality Index (lower or upper)

\bar{X} = Mean (average) value of air voids in percent

(% air voids = 100 - % density)

S = Standard Deviation of test results

For mat in-place air voids, estimate the **Percentage Within Tolerance (PWT)** for the lower and upper tolerance limits by entering Table 8 with Q_L and Q_U using the column appropriate to the total number (n) of core samples. The total percent of material between the lower and upper limits is defined as the **Percent Within Limits** and is calculated by the following formula:

$$PWL = [PWT(lower) + PWT(upper)] - 100$$

Each lot of bituminous material shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When the PWL is below 90 percent for a given lot, the lot tonnage shall be adjusted in accordance with Table 7.

TABLE 7 - PAY ADJUSTMENT SCHEDULE (see note 2.)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	1.

1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.
 2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.
- (d) Mix sampling All mix sampling shall be done on a random basis as determined by the Resident Engineer. Samples that are obviously defective or become defective prior to testing shall be discarded and retaken. New samples shall be considered as if they were initial samples.

401-4.15 SAMPLING PAVEMENT

Delete this section and replace with the following:

401-4.15 Sampling Pavement Cores from each subplot shall be taken at random locations as outlined by the Resident Engineer. No core samples shall be taken within two feet of the edge of pavement. Any core less than 1-1/2 inch thickness shall not be used and a new location and sample shall be selected.

Core samples of approximately 4 inches in diameter, for determination of in-place air voids of the completed pavement, shall be obtained by the Contractor at no extra expense. The number and locations of the samples shall be as determined by the Resident Engineer. The Contractor shall furnish all tools, labor, and materials for sampling and replacing pavement.

All core tests necessary to determine initial conformance with specification requirements will be performed by the Resident Engineer at no cost to the Contractor.

- (a) Resampling and Retesting Resampling of a lot may be allowed only under the following conditions:

CHECK SHEET #18

- (1) The Contractor must request, in writing, the resampling and retesting of a complete lot within 48 hours after receiving the written test results of the lot from the Resident Engineer. Only one retest per lot will be permitted.
- (2) If the retested lot should result in a higher "Percent Within Limits" figure than the original, based on all lot samples (original and new) the following will apply:
 - (a) The cost of resampling and retesting will be borne by the Engineer.
 - (b) The new "Percent Within Limits" figure shall be calculated using all LOT samples, (original and new) for calculating the lot payment.
- (3) If the retested lot should result in a "Percent Within Limits" figure equal to or less than the original, based on all the lot samples (original and new), the following will apply:
 - (a) The cost of resampling and retesting will be borne by the Contractor.
 - (b) The new "Percent Within Limits" figure shall be calculated using all lot samples, (original and new) for calculating the lot payment.
- (4) Procedures in ASTM E-178 shall be used to determine outliers based on all samples taken and a 5% significance level.
- (5) Results of the retesting and resampling shall be final."

The completed pavement shall be cleaned so that no debris or dirt from coring operations is left on the surface of the pavement.

401-6.1 BASIS OF PAYMENT

Delete this section and replace with the following:

"401-6.1 Basis of Payment The quantity of bituminous surface course mixture measured as outlined in Section 401-5.1 shall be adjusted in accordance with Section 401-4.13 herein. Payment shall be calculated by multiplying the contract unit price per ton of bituminous base course and the adjusted tons per lot. Final payment shall be compensation for furnishing all materials, for all preparation, mixing, testing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

The test section shall be paid for at the contract unit price per each, which price shall include the additional specified equipment, labor, Engineering, and testing time necessary to construct this item.

Payment will be made under:

Item AR401610 -- Bituminous Surface Course -- per ton.

Item AR401620 -- Bit. Surface Course, Leveling -- per ton.

Item AR401630 -- Bituminous Surface Test Section -- per each.

CHECK SHEET #18

TABLE 8
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX (QL or QU)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789	1.0788	1.0787
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382	1.0377	1.0374
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990	0.9982	0.9976
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643	0.9624	0.9610	0.9599	0.9591
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241	0.9228	0.9219
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882	0.8868	0.8857
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533	0.8517	0.8505
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192	0.8175	0.8161
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858	0.7840	0.7826
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531	0.7513	0.7498
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211	0.7192	0.7177
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896	0.6877	0.6861
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587	0.6567	0.6551
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282	0.6262	0.6247
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982	0.5962	0.5947
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686	0.5667	0.5651
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454	0.5419	0.5394	0.5375	0.5360
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105	0.5086	0.5072
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820	0.4802	0.4787
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537	0.4520	0.4506
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310	0.4280	0.4257	0.4241	0.4227
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031	0.4001	0.3980	0.3964	0.3951
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705	0.3690	0.3678
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432	0.3418	0.3407
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161	0.3148	0.3137
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892	0.2880	0.2870
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624	0.2613	0.2604

TABLE 8 (Continued)
 TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
 (STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358	0.2348	0.2339
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2083	0.2084	0.2076
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829	0.1821	0.1814
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566	0.1559	0.1553
55	0.1806	0.1500	0.1406	0.1353	0.1338	0.1322	0.1312	0.1304	0.1298	0.1293
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1048	0.1042	0.1038	0.1034
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792	0.0786	0.0781	0.0778	0.0775
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521	0.0518	0.0516
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260	0.0259	0.0258
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260	-0.0259	-0.0258
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521	-0.0518	-0.0516
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781	-0.0778	-0.0775
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1048	-0.1042	-0.1038	-0.1034
45	-0.1806	-0.1500	-0.1406	-0.1353	-0.1338	-0.1322	-0.1312	-0.1304	-0.1298	-0.1293
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566	-0.1559	-0.1553
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829	-0.1821	-0.1814
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2083	-0.2084	-0.2076
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358	-0.2348	-0.2339
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624	-0.2613	-0.2604
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892	-0.2880	-0.2870
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161	-0.3148	-0.3137
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432	-0.3418	-0.3407
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705	-0.3690	-0.3678
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980	-0.3964	-0.3951
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4354	-0.4310	-0.4280	-0.4257	-0.4241	-0.4227
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537	-0.4520	-0.4506
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820	-0.4802	-0.4787
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105	-0.5087	-0.5072
30	-0.6787	-0.6000	-0.5719	-0.5583	-0.5504	-0.5454	-0.5419	-0.5394	-0.5375	-0.5360
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686	-0.5667	-0.5651
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982	-0.5962	-0.5947
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282	-0.6262	-0.6217
26	-0.7904	-0.7200	-0.6920	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587	-0.6567	-0.6551
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896	-0.6876	-0.6861
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211	-0.7192	-0.7177
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531	-0.7513	-0.7498
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858	-0.7840	-0.7826
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8246	-0.8214	-0.8192	-0.8174	-0.8161
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533	-0.8517	-0.8505

CHECK SHEET #18

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882	-0.8868	-0.8057
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241	-0.9228	-0.9219
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610	-0.9599	-0.9591
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990	-0.9982	-0.9976
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382	-1.0377	-1.0374
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789	-1.0788	-1.0787
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212	-1.1215	-1.1217
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653	-1.1661	-1.1668
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115	-1.2129	-1.2141
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602	-1.2623	-1.2640
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118	-1.3148	-1.3172
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670	-1.3709	-1.3741
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265	-1.4316	-1.4358
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4716	-1.4829	-1.4914	-1.4981	-1.5035
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635	-1.5721	-1.5790
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5872	-1.6127	-1.6313	-1.6454	-1.6566	-1.6655
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6992	-1.7235	-1.7420	-1.7566	-1.7684
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8054	-1.8379	-1.8630	-1.8828	-1.8989
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362	-2.0657	-2.0897

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR401640 BITUMINOUS PAVEMENT GROOVING

Effective: January 1, 2003

DESCRIPTION

1.1 GENERAL

This item shall consist of constructing a skid resistant surface by providing sawcut grooves in the new bituminous surface.

EQUIPMENT

2.1 GROOVING EQUIPMENT

The equipment used for grooving shall be power saw cutting equipment, equipped with diamond blades mounted on a multi-blade arbor spaced to groove the runway to the dimensions specified herein, and as shown on the plans.

A cutting head width capable of grooving the runway to the specified tolerances shall be maintained.

The grooving equipment shall be equipped with automatic groove depth control which shall automatically adjust the cutting head and maintain groove depth within the specified tolerances. Sensors for depth control shall be located immediately adjacent to the axis of the cutting head.

The grooving equipment shall be equipped to meet the requirements of this item.

The Contractor shall submit a complete list of grooving equipment to be used on the job for approval by the Resident Engineer before start of the work.

CONSTRUCTION METHODS

3.1 CURE TIME

Grooving operations shall not be initiated until after the specified cure period.

3.2 GROOVE DIMENSIONS

Grooves shall be saw-cut in the pavement to the dimensions detailed in the plans.

The grooves shall be continuous for the entire runway length.

Grooves shall be cut at 90° to the runway centerline to within 10 feet of the runway pavement edge but not exceeding 130 feet.

Alignment shall not vary by plus or minus 1-1/2" for 75 feet.

Groove tolerances shall be:

Minimum depth = 3/16 inch.

Maximum depth = 5/16 inch.

Minimum width = 3/16 inch.

Maximum width = 5/16 inch.

Center to center spacing tolerances shall be:

Minimum spacing = 1 ¼ inches.

Maximum spacing = 2 inches.

3.3 TEST SECTION

Before initiating grooving operations on the runway, the Contractor shall demonstrate the performance of his operations and machines on a section of pavement designated by the Resident Engineer of similar construction to the runway. The Contractor shall have on hand each machine and each operator he proposes to use for runway grooving, and each combination groove a test section approximately 30 feet in width and 60 feet in length. The requirements of these specifications must be met before beginning of grooving of the runway. No payment will be made for this test strip.

3.4 REMOVAL OF SLURRY

The removal of slurry shall be continuous throughout the grooving operations. The grooving equipment shall be equipped with vacuum slurry pick-up equipment which shall continuously pick up water and sawing dust, and pump the slurry to a collection tank.

Clean-up is extremely important and should be continuous throughout the grooving operation. All grooved areas of the runway shall be flushed with clear water as soon as possible to remove any slurry material not collected

by the vacuum pickup. Flushing shall be continued until all pavement surfaces are clean to the satisfaction of the Resident Engineer.

The Contractor shall dispose of the slurry at off of airport property. Waste material must not be allowed to enter the airport storm or sanitary sewer, or any natural or constructed waterways.

METHOD OF MEASUREMENT

4.1

When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

The quantity of Bituminous Pavement Grooving to be paid for shall be the number of square yards of grooving, as specified, completed and accepted.

BASIS OF PAYMENT

5.1

Payment will be made at the contract unit price per square yard for Bituminous Pavement Grooving, which shall be full compensation for all materials, including water, labor, equipment, tools, runway cleaning, slurry removal and incidentals necessary to complete the work.

Payment will be made under:

Item AR401640 -- Bituminous Pavement Grooving -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR401650 BITUMINOUS PAVEMENT MILLING

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item of work shall consist of removing variable depths of existing bituminous surface, as shown in the plans and as directed by the Resident Engineer.

EQUIPMENT

- 2.1 Equipment used shall be subject to approval by the Engineer and shall comply with the following:

Surface removal equipment shall be a power-operated mechanical scarifier, roto-mill, planing machine, grinder or other device capable of removing the surface to the depth indicated leaving a sound, bondable surface.

The equipment shall be in good working condition free from oil or fuel leaks. Power brooms and sweepers, vacuum sweepers and air compressors shall be in good working condition and shall be used in sufficient numbers or combinations to remove dust and debris from the milled surface.

CONSTRUCTION METHODS

- 3.1 The Contractor shall remove the pavement surface to the limits shown in the plans and as directed by the Resident Engineer. The material removed shall be disposed of off Airport property. The roughened surface shall be free of dirt and loose material prior to subsequent paving. If power brooms or sweepers are used, the surface shall be cleaned with high pressure air to remove dust and debris.

The temperature at which the work is performed, the nature and condition of the equipment and the manner of performing the work shall be such that the milled surface is not torn, gouged, shoved or otherwise injured by the milling operation. Sufficient cutting passes shall be made so that all irregularities or high spots are eliminated to the satisfaction of the Engineer.

METHOD OF MEASUREMENT

- 4.1 The yardage to be paid for shall be the number of square yards of bituminous pavement milling as measured in the field, completed and

accepted. Pavement milling required for butt joint construction will not be measured for payment under this item.

BASIS OF PAYMENT

5.1 The accepted quantities of bituminous pavement milling will be paid for at the contract unit price per square yard which price and payment shall be full compensation for furnishing all materials, equipment, labor, hauling, and all other incidental items necessary to complete the work to the satisfaction of the Engineer.

Payment will be made under:

Item AR401550 -- Bituminous Pavement Milling -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401655 BUTT JOINT CONSTRUCTION

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of removing existing bituminous pavement or PCC pavement surface to a variable depth to construct a butt joint for the transition of the proposed bituminous overlay at the locations as shown in the plans.

EQUIPMENT AND MATERIALS

- 2.1 The Contractor may use mill machines or other approved devices for removal of existing bituminous or PCC pavement at the locations and to the depths shown on the plans.

- 2.2 Bituminous tack coat shall conform to Item 603.

CONSTRUCTION METHODS

- 3.1 The Contractor shall construct the butt joint to the dimensions shown on the plans. The material removed shall be disposed of off the airport property by the Contractor. The minimum area for removal is shown on the plans.

The edge of the butt joint shall be sawed to the minimum depth prior to any surface removal as shown on the plans. The joint must be straight and perpendicular to the taxiway, runway or service road centerlines or appropriate baselines.

Before placement of the new bituminous material, the joint surface and vertical edges shall be bituminous tack coated in accordance with Item 603.

METHOD OF MEASUREMENT

- 4.1 The butt joint construction to be paid for shall be measured by the square yard.

BASIS OF PAYMENT

- 5.1 Payment for butt joint construction shall be made at the contract unit price per square yard. This price shall include full compensation for sawing, removal, prime coat, and disposal including furnishing all labor, tools, equipment and incidentals necessary to complete this item of work.

Payment will be made under:

Item AR401655 -- Butt Joint Construction -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR401900 REMOVE BITUMINOUS PAVEMENT

Effective: January 1, 2003

DESCRIPTION

1.1 This item of work shall consist of removing bituminous pavement structure as described herein.

The Contractor shall remove bituminous concrete of the thickness shown in the plans.

Typical construction details are shown in the plans. Exact locations of bituminous pavement removal shall be determined by the Resident Engineer.

CONSTRUCTION METHODS

3.1 The Contractor shall sawcut the existing pavement structure full depth as shown in the plans at locations determined by the Resident Engineer. Sawcutting shall provide a vertical surface.

After completion of sawcutting, the Contractor shall remove the pavement structure using methods which will allow a vertical surface along all sides of the removal area.

Material obtained from removal operations shall be hauled to a disposal site off of airport property by the Contractor. No additional compensation will be made for hauling and disposal of the removed material. Existing aggregate base shall be compacted in accordance with Item 209. Existing subgrade shall be compacted in accordance with Item 152.

METHOD OF MEASUREMENT

4.1 The yardage to be paid for shall be the number of square yards of bituminous pavement removal as measured in the field, completed and accepted.

BASIS OF PAYMENT

5.1 The accepted quantities of bituminous pavement removal will be paid for at the contract unit price per square yard which price and payment shall be full compensation for furnishing all materials, equipment, labor, hauling, disposal

and all other incidental items necessary to complete the work to the satisfaction of the Engineer.

Payment will be made under:

Item AR401900 -- Remove Bituminous Pavement -- per square yard.

State of Illinois
 Department of Transportation
 Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR 501001 PORTLAND CEMENT CONCRETE PAVEMENT – METHOD I
 (Less than or equal to 1500 cubic yards)

Effective: January 1, 2003

This Special Provision Modifies Item 501 Portland Cement Concrete Pavement of the Standard Specifications.

501-1.1 Delete the first paragraph and replace with the following:

"This work shall consist of pavement composed of Portland Cement concrete, or pavement composed of Portland Cement concrete with partial replacement of cement with fly ash only, or with partial replacement of cement with Ground Granulated Blast-furnace (GGBF) slag only, with or without reinforcement, constructed on a prepared subgrade, subbase, or base course in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross sections on the plans.

501-2.1 FINE AGGREGATE

Delete the first sentence and replace with the following:

"Fine aggregate shall be defined as follows:

Sand. Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles and shall meet the following quality requirements:"

QUALITY TEST(IDOT A Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	10
Minus No. 200 Sieve Mat'l ASTM C 136 Max. %	3

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	1.0
Coal, Lignite & Shells %	1.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>3.0</i>

501-2.2 COARSE AGGREGATE

Delete this Section and replace with the following:

"Coarse aggregate shall be a non "D" cracking crushed stone as determined by the Department of Transportation.

Crushed stone. Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

The coarse aggregate shall also conform to the following quality requirements:

QUALITY TEST(A Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	45
Minus No. 200 Sieve Mat'l ASTM C 136 Max. %	<u>1/</u>

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	1.0
Clay Lumps %	0.25
Coal, Lignite & Shells %	0.25
Soft & Unsound %	4.0
Other Deleterious %	4.0 <u>2/</u>
Total Deleterious Allowed %	5.0

1/ NOTE: If the material finer than the No. 200 sieve consists of dust from the fracture, essentially free from clay or silt, this percentage may be increased to 2.5%.

2/ NOTE: Includes deleterious chert. Deleterious chert shall be the lightweight fraction separated in a 2.55 heavy media separation.

Delete Table 2 and use the following gradations:

Sieve	$\frac{3}{4}$ " – No. 4	1" – No. 4
2	--	--
1 $\frac{1}{2}$	--	100
1	100	90-100
$\frac{3}{4}$	84-100	--
$\frac{1}{2}$	30-60	30-60
No. 4	0-12	0-10
No. 16	--	--
IDOT Gradation	(CA-11)	(CA-07)

501-2.3 CEMENT

Delete this section and replace with the following:

"501-2.3 Cementitious Material

- (a) Cement. Type I cement conforming to the requirements of ASTM C 150 shall be required.
- (b) Fly Ash. The fly ash shall meet the requirements of ASTM C 618, for Class C fly ash. The fly ash source shall be approved by the IDOT, and the conditions outlined by Policy Memorandum No. 88-1, Quality Control Requirements For Fly Ash For Use In Portland Cement Concrete, effective January 1, 1988, or latest edition, as issued by IDOT Bureau of Materials and Physical Research. Fly ash shall not be used in concrete mixtures after October 15 nor before April 1 unless the contractor demonstrates, by preparing a Test Batch, a 14 day strength no less than that obtained from the equivalent cement-only mix. The test batch for both the fly ash and cement-only mix shall be prepared in accordance with 501-3.6(A) or 501-3.6(B) and shall be constructed at no additional expense to the contract.
- (c) Ground Granulated Blast-furnace Slag. The (GGBF) shall consist of the glassy granular material formed when molten blast-furnace slag is rapidly chilled, and then finely ground. Type 1S portland blast-furnace slag cement or Type 1 (SM) slag-modified portland cement may be used at the option of the contractor provided the slag constituent does not exceed 25% of the mass (weight) of the portland blast-furnace slag cement. Portland blast-furnace slag cements shall not be used after October 15th nor before April 1st. The GGBF slag shall meet the standard physical and chemical requirements of AASHTO M-302, for grade 100 or grade 120 material. The GGBF slag shall meet the requirements of the Department's latest Policy Memorandum, Acceptance Procedure of Finely Divided Minerals Used in Portland Cement Concrete and Other Applications. The GGBF slag must come from one of the approved suppliers on the Department's latest Annual List of Approved Suppliers of GGBF slag for P.C. Concrete. A Job Mix Formula (JMF) with portland cement, flyash, and GGBF slag will not be allowed for use on the project unless approved by the Engineer. GGBF slag shall not be used in concrete mixtures when the air temperature is below 40 °F. Different sources or grades of GGBF slag shall not be mixed or used alternately in the same item of construction.

501-2.7 DOWEL AND TIE BARS

Replace the second paragraph with the following:

Dowel bars shall be plain, round steel bars conforming to the requirements of AASHTO M227 Grades 70 through 80. The finished bars shall be saw cut and free from burrs or out-of-round ends which will prevent their slipping easily in the concrete. The bars shall be epoxy coated according to the requirements of AASHTO M254.

501-2.10 ADMIXTURES

Delete "(a) Pozzolan Admixtures", "(b) Air-Entraining Admixtures", "(c) Water-Reducing Admixtures" and add the following to the first paragraph:

"Air-Entraining Admixture and Water-Reducing Admixtures shall be required. Retarding admixtures may be used when approved by the Engineer. High Range Water Reducer may be required to achieve the workability needed by the contractor. The use of High Range Water Reducer shall be at no extra expense to the contract. All admixtures shall be approved by the Engineer."

(a) Air Entraining Admixtures

"Air-entraining admixtures approved by IDOT shall be used."

(b) Water-reducing Admixtures

"Water-reducing admixtures approved by IDOT shall be used."

(c) Retarding Admixtures

"Retarding admixtures approved by IDOT shall be used."

(d) High Range Water-Reducing Admixtures

"High range Water-reducing admixtures approved by IDOT shall be used."

501-2.11 CHEMICAL ADHESIVES

When it is necessary to anchor dowel and/or tie bars to hardened concrete, a chemical adhesive shall be used. The chemical adhesive resin system shall consist of a 2-part, fast setting resin and filler/hardener, and must be on the Illinois Department of Transportation's most recent Approved Chemical Adhesives List. (The latest list is available through the Materials Section of the Division of Aeronautics). The adhesive shall be mixed in accordance with the manufacturer's instructions. After drilling, the hole shall be blown out with compressed air to remove any dust. The hole shall also be dry before installing dowel or tie bars. The adhesive shall be injected into the hole in a manner that fills from the back of the hole to approximately one third of its depth. When the bar is inserted, the quantity of adhesive shall be such that a small amount leaks out of the front of the hole. The Division of Aeronautics retains the right to test the chemical adhesive and the method of installation as a condition of approval.

501-3.1 EQUIPMENT

Add the following to the first paragraph:

"The concrete plant(s) shall conform to the following requirements or the Engineer may accept the use of a concrete plant approved by the IDOT

CHECK SHEET #23

Division of Highways, in accordance with Section 1103 of the Standard Specifications for Road and Bridge Construction.”

Add the following as a second paragraph under (a) Batching Plant and Equipment, (1) General:

“The Batching Plant shall be a computerized plant interfaced with a printer and shall print actual batch weights, added water, tempering water, mixing time, and amount of each additive per batch.”

Add the following as a second paragraph under (a) Batching Plant and Equipment, (2) Bins and Hopper:

“Cement and fly ash shall be stored in separate bins. When a manual plant is utilized, cement and fly ash shall be weighed in a separate weigh hopper. When an automatic batching plant is utilized, the fly ash may be weighed into the cement weigh hopper.”

501-3.5 HANDLING, MEASURING, AND BATCHING MATERIAL

Add the following to the first paragraph:

“Loading out from stockpiles for purposes of batching, shall be accomplished in a systematic manner to minimize highly variable moisture contents. After concrete production begins, the contractor shall load out of an established stockpile while the others are constructed.”

Add the following to the sixth paragraph:

“The air entrainment and water reducing admixtures shall be incorporated into the batch water stream during the batching process. Each additive must be added separately to the mixing water, with no intermixing of additives.”

501-3.6(A) PROPORTIONS

Delete the first paragraph and replace with the following:

“Proportioning requirements for the concrete shall be designed for a field compressive strength of 4000 psi at 28 days for pavements designed for aircraft weighing less than 60,000 pounds”. The Contractor shall note that to ensure that not more than 10 percent of the concrete actually produced will fall below the specified strength, the mix design average strength must be considerably higher than the specified strength. The concrete strength necessary to meet specification requirements depends on the producer’s standard deviation of compressive test results and the accuracy which that value can be estimated from historic data for the same or similar materials.

Delete the second paragraph and replace with the following:

“Prior to the start of paving operations and after approval of all materials to be used in the manufacture of the concrete, the Engineer will provide the mix design based on the IDOT computer generated mix design system. The contractor may submit his own mix design with substantiating test data subject to approval by the Engineer. The mix design shall produce a compressive strength of at least 800 psi over the specified field strength. Test specimens

shall be required to verify mix design parameters. Compressive strength shall be as specified at 28 days using test specimens prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 39."

The contractor shall be required to provide all Quality Control personnel for the manufacture of the concrete. Quality Control shall be performed in accordance with the Division of Aeronautics' Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture. The use of a microwave moisture probe or equal for purposes of determining the percent moisture in the fine aggregate may be allowed when approved by the Engineer. The microwave moisture probe must be interfaced with the plant batching computer. The percent of free moisture (Above Saturated Surface Dry Moisture) and the adjusted fine aggregate batch weight must be determined by the microwave moisture probe and indicated on the computer screen for each batch. As part of the approval process, the contractor shall obtain a minimum of 10 samples of fine aggregate within the proximity at which the probe is fixed below the fine aggregate bin. The contractor shall determine the percent moisture (Above Saturated Surface Dry Moisture) by the Adjusted Oven Dry Method, the Chapman Flask, the Pycnometer Jar Method or the Dunagan Method for each sample. A correlation shall then be established between the contractor's results and the corresponding percent moisture indicated by the microwave moisture probe for each sample taken. If necessary, adjustments to the microwave probe should be made so that the correct percent moisture is utilized during the batching process. The calibration procedure described herein shall be completed in the presence of and witnessed by the Resident Engineer.

Delete the fifth paragraph and replace with the following:

"The cement content specified in this paragraph is a minimum. If the results of the Test Batch strength testing fail to meet the requirements of the contract, the contractor may have to increase the cement content, select different material sources, or some combination of these or other mix design adjustments. Additional costs for increased cement or other adjustments necessary to produce an acceptable mix shall be borne by the contractor. The cement content shall not be less than 6.5 sacks (611 lbs.) per cubic yard. However, if the contractor can demonstrate that the selected course aggregate gradation has a minimum of 50 percent passing the ½ inch sieve, the minimum cement content may be reduced to 6.25 sacks (588 lbs.) per cubic yard. As a minimum for approval, the contractor shall provide 10 recent gradation tests on aggregate taken from the proposed course aggregate stockpile intended for use in the project. All ten gradation test results must meet the 50% passing the ½ inch sieve requirement in addition to meeting the rest of the CA-7 or CA-11 specification. In order to achieve 50% passing the ½ inch sieve, combining aggregate sizes will be permitted. Two or more aggregate sizes consisting of IDOT gradations CA-7, CA-11, CA-13, CA14, and CA-16 of the same coarse aggregate quality requirements specified under section 501-2.2 may be combined. However a CA-7 or CA-11 shall be included in the blend. The mathematically combined coarse aggregate gradation shall be determined in the same manner as for a coarse and fine aggregate blend, which is discussed in the most current edition of the "Portland Cement Concrete Level II Technician Course" manual. Each size shall be stored separately and care

CHECK SHEET #23

shall be taken to prevent them from being mixed until they are ready to be proportioned. The contractor will be permitted to mix more than two sizes of coarse aggregate, provided the separate sizes selected and the proportions used in combining them are approved by the Engineer and that separate compartments are provided to proportion each size.

When Class C fly ash is used, the amount of cement replaced shall not exceed 20 percent by mass (weight) or 122 pounds, at a replacement ratio of 1.25 to 1 (fly ash: cement replaced). Fly ash and cement weights will be rounded up to the nearest 5 lbs. in the mix design. For cement-fly ash mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag : cement replaced) shall be a 1 to 1 replacement for Grade 100 or Grade 120. For cement-GGBF slag mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. Measurements of GGBF slag and cement shall be rounded up to the nearest 5 lb. in the mix design.

Add the following three paragraphs after the last paragraph of this Section.
"Test Batch. At least 28 days prior to the start of production the contractor and/or producer shall prepare a Test Batch under the direction of the Engineer. The Test Batch shall be prepared at the concrete plant proposed for use in the production of the concrete mix for the project and shall be in accordance with the approved Job Mix Formula (JMF). When approved by the Engineer, the Test Batch may be prepared at a different plant provided that the same materials specified in the (JMF) are used. In addition, the proposed Test Batch plant must meet the plant requirements specified herein. If more than one (JMF) is required as a result of different sources of materials, additional test batches shall be conducted for each (JMF) as outlined herein. The cost for each additional test batch shall be borne by the contractor. The plant shall have been surveyed and approved by the Engineer prior to preparation of the Test Batch. As required by these Special Provisions the contractor shall provide all Quality Control for production of the concrete. The Test Batch shall be prepared as follows:

1. Proportioning. Prior to preparation of the mix, the Proportioning Technician shall perform a minimum of two (2) gradation analyses and two (2) moisture tests on each aggregate used. In order to obtain representative aggregate moisture, the contractor shall construct a small stockpile for both the coarse and fine aggregates. The small stockpiles shall contain enough material to manufacture as many test batches as the contractor decides to make. An aggregate sample shall be obtained from each small stockpile using proper aggregate sampling techniques for obtaining a representative sample. The free moisture for each aggregate shall be determined. From this data, the (JMF) shall be adjusted for moisture, as outlined in IDOT's Manual of Instructions for Concrete Proportioning and Testing.

2. Preparation of the Mix:

- A) Prepare a Test Batch that is at least one-half (1/2) the manufacturer's rated capacity of the mixing drum (in cubic yards). The Test Batch shall be prepared in accordance with the approved (JMF), adjusted for moisture.
- B) Mixing requirements shall be:
- a) Central Mix Plant: Minimum of 90 seconds. If transit mixer trucks are used to transport the mix, the mix shall be agitated, after mixing, at 2-5 RPM for the approximate travel time anticipated between batching at the plant and deposit of the concrete in the forms.
- If non-mixing trucks are used to transport the mix, the mix shall remain in the central mixer with no mixing or agitation for the approximate time anticipated from when the water contacts the cement and deposit of the concrete in the forms.
- b) Transit Mix Plant: 70-100 Revs. @ 5-16 RPM. After initial mixing, agitate mix at 2-5 RPM for the approximate time anticipated from when mixing is complete and deposit of the concrete in the forms.
- C) Air, Slump, and Water/Cement Ratio (w/c): After aging, the air content of the concrete shall be 6.0% plus or minus 1.5%. The slump and water/cement ratio shall not exceed the following criteria as outlined by Table 1 below:

TABLE 1: 4000 PSI CONCRETE

<u>CONCRETE TEMPERATURE</u>	<u>CEMENT MIX</u>		<u>CEMENT FLYASH MIX</u>		<u>IDOT RECOMMENDED DOSAGE of WATER REDUCER</u>
	<u>MAX W/C</u>	<u>MAX SLUMP</u>	<u>MAX W/C</u>	<u>MAX SLUMP</u>	
50-60°F	0.44	4 IN.	0.40	4 IN.	1 TIMES
61-70°F	0.44	4 IN.	0.40	4 IN.	1 TIMES
71-80°F	0.44	3 IN.	0.41	3 IN.	1 TIMES
81-90°F*	0.44	2 IN.	0.42	2 IN.	*1 TIMES
91-95°F	0.44	1.5 IN.	0.42	1.5 IN.	1.5 TIMES

* At 85°F and above, the dosage of water reducer shall be 1.5 times the recommended dosage. Concrete produced at these temperatures may require the use of Mid Range Water Reducers and/or Retarding admixtures. If shrinkage cracks should develop at any time, the paving operation shall cease until the condition is corrected by the contractor. This may require the use of additional admixtures and/or the use of a fog sprayer system on the finishing equipment.

NOTE: The actual water/cement ratio established at the time of the Test Batch shall be the maximum permitted for production concrete. The maximum slump shall be established from TABLE 1 using the actual temperature of the concrete at the time of production. This slump may be exceeded to a maximum limit of 4 inches when approved by the Engineer and by the use of superplasticizer only.

Once the concrete conforms to TABLE 1, cylinders shall be made for testing at 3,7,14, and 28 days. With permission from the Engineer at the time of the Test Batch, the maximum slump may be exceeded provided the maximum allowable water-cementitious ratio is not exceeded. In addition, the contractor should be aware that if the Test Batch concrete does not obtain 4800 PSI at 28 days, a new Test Batch shall be required at the contractor's expense.

- D) The Proportioning Technician shall complete Form AER M-7, Plastic, Concrete Air, Slump and Quantity and Form AER M-6, Concrete Moisture Determination (Adjusted Oven Dry Method), to be given to the Resident Engineer after completion of the Test Batch.
- E) The Resident Engineer shall complete Form AER M-4, Concrete Plant Production, Mix Verification.
- F) The concrete test cylinders shall be tested at 3, 7, 14 and 28 days to establish a growth curve of concrete strength vs. age. The compressive strength shall be at least 800 psi, over the specified strength, at 28 days.

The Test Batch shall be paid for under Section 501-5.30. Only one Test Batch will be paid for per project. Any additional Test Batches shall be paid for by the contractor.

The contractor shall provide complete facilities for the curing of the cylinders on the job site. Curing facilities for test cylinders shall include, but not be limited to, furnishing and operating water tanks equipped with temperature control devices that will automatically maintain the temperature of the water as specified in ASTM C 31. Submersible heaters are acceptable provided the above mentioned criteria are achieved.

502-3.6 (B) PROPORTIONS

Delete the first paragraph and replace with the following:
"Proportioning requirements for concrete shall be designed for a field flexural strength of 650 psi at 28 days for pavements designed for aircraft weighing 60,000 pounds or more". The Contractor shall note that to ensure that not more than 10 percent of the concrete actually produced will fall below the specified strength, the mix design average strength must be higher than the specified strength. The concrete strength necessary to meet specification requirements depends on the producer's standard deviation of flexural test results and the accuracy which that value can be estimated from historic data for the same or similar materials.

Delete the second paragraph and replace with the following:

"Prior to the start of paving operations and after approval of all materials to be used in the manufacture of the concrete, the Engineer will provide the mix design based on the IDOT computer generated mix design system. The contractor may submit his own mix design with substantiating test data subject to approval by the Engineer. The mix design shall produce a flexural strength of at least 100 psi over the specified field strength. Test specimens shall be required to verify mix design parameters. Flexural strength shall be as specified at 28 days using test specimens prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 78. For side form concrete, superplasticizer shall be required."

The contractor shall be required to provide all Quality Control personnel for the manufacture of the concrete. Quality Control shall be performed in accordance with the Division of Aeronautics' Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture. The use of a microwave moisture probe for purposes of determining the percent moisture in the fine aggregate may be allowed when approved by the Engineer. The microwave moisture probe must be interfaced with the plant batching computer. The percent of free moisture (Above Saturated Surface Dry Moisture) and the adjusted fine aggregate batch weight must be determined by the microwave moisture probe and indicated on the computer screen for each batch. As part of the approval process, the contractor shall obtain a minimum of 5 samples of fine aggregate within the proximity at which the probe is fixed below the fine aggregate bin. The contractor shall determine the percent moisture (Above Saturated Surface Dry Moisture) by the Adjusted Oven Dry Method, the Chapman Flask, or the Dunagan Method for each sample. A correlation shall then be established between the contractor's results and the corresponding percent moisture indicated by the microwave moisture probe for each sample taken. If necessary, adjustments to the microwave probe should be made so that the correct percent moisture is utilized during the batching process. The calibration procedure described herein shall be completed in the presence of, and witnessed by the Resident Engineer.

Delete the fifth paragraph and replace with the following:

"The cement content specified in this paragraph is a minimum. If the results of the Test Batch strength testing fail to meet the requirements of the contract, the contractor may have to increase the cement content, select different material sources, or some combination of these or other mix design adjustments. Additional costs for increased cement or other adjustments necessary to produce an acceptable mix shall be borne by the contractor. The cement content shall not be less than 6.5 sacks (611 lbs.) per cubic yard. However, if the contractor can demonstrate that the selected course aggregate gradation has a minimum of 50 percent passing the ½ inch sieve, the minimum cement content may be reduced to 6.25 sacks (588 lbs.) per cubic yard. As a minimum for approval, the contractor shall provide 10 recent gradation tests on aggregate taken from the proposed course aggregate stockpile intended for use in the project. All ten gradation test results must meet the 50% passing the ½ inch sieve requirement in addition to meeting the rest of the CA-7 or CA-

CHECK SHEET #23

11 specification. In order to achieve 50% passing the ½ inch sieve, combining aggregate sizes will be permitted. Two or more aggregate sizes consisting of IDOT gradations CA-7, CA-11, CA-13, CA14, and CA-16 of the same coarse aggregate quality requirements specified under section 501-2.2 may be combined. However a CA-7 or CA-11 shall be included in the blend. The mathematically combined coarse aggregate gradation shall be determined in the same manner as for a coarse and fine aggregate blend, which is discussed in the most current edition of the "Portland Cement Concrete Level II Technician Course" manual. Each size shall be stored separately and care shall be taken to prevent them from being mixed until they are ready to be proportioned. The contractor will be permitted to mix more than two sizes of coarse aggregate, provided the separate sizes selected and the proportions used in combining them are approved by the Engineer and that separate compartments are provided to proportion each size.

When Class C fly ash is used, the amount of cement replaced shall not exceed 20% by mass (weight) or 122 pounds, at a replacement ratio of 1.25 to 1 (fly ash: cement replaced). Fly ash and cement weights will be rounded up to the nearest 5 lbs. in the mix design. For cement-fly ash mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag : cement replaced) shall be a 1 to 1 replacement for Grade 100 or Grade 120. For cement-GGBF slag mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. Measurements of GGBF slag and cement shall be rounded up to the nearest 5lbs. in the mix design.

Add the following paragraph after the last paragraph of this Section.

"Test Batch. At least 28 days prior to the start of production the contractor and/or producer shall prepare a Test Batch under the direction of the Resident Engineer. The Test Batch shall be prepared at the concrete plant proposed for use in the production of the concrete mix for the project and shall be in accordance with the approved Job Mix Formula (JMF). When approved by the Engineer, the Test Batch may be prepared at a different plant provided that the same materials specified in the (JMF) are used. In addition, the proposed Test Batch plant must meet the plant requirements specified herein. If more than one (JMF) is required as a result of different sources of materials, additional test batches shall be conducted for each (JMF) as outlined herein. The cost for each additional test batch shall be borne by the contractor. The plant shall have been surveyed and approved by the Engineer prior to preparation of the Test Batch. As required by these Special Provisions the contractor shall provide all Quality Control for production of the concrete. The contractor shall have his Quality Control Officer and a representative of the contractor familiar with the paving operation, present at the test batch preparation. The Test Batch shall be prepared as follows:

1. Proportioning. Prior to preparation of the mix, the Proportioning Technician shall perform a minimum of two (2) gradation analyses and two (2) moisture tests on each aggregate used. In order to obtain representative aggregate moisture, the contractor shall construct a small stockpile for both the coarse and fine aggregates. The small stockpiles shall contain enough

material to manufacture as many test batches as the contractor decides to make. An aggregate sample shall be obtained from each small stockpile using the proper aggregate sampling techniques for obtaining a representative sample. The free moisture for each aggregate shall be determined. From this data, the (JMF) shall be adjusted for moisture, as outlined in IDOT's Manual of Instructions for Concrete Proportioning and Testing.

2. Preparation of the Mix:

A) Prepare a minimum Test Batch that is at least one-half (1/2) the manufacturer's rated capacity of the mixing drum (in cubic yards). The Test Batch shall be prepared in accordance with the approved (JMF), adjusted for moisture.

B) Mixing requirements shall be:

a) Central Mix Plant: Minimum of 90 seconds. If transit mixer trucks are used to transport the mix, the mix shall be agitated, after mixing, at 2-5 RPM for the approximate travel time anticipated between batching at the plant and deposit of the concrete in the forms.

If non-mixing trucks are used to transport the mix, the mix shall remain in the central mixer with no mixing or agitation for the approximate time anticipated from when the water contacts the cement and deposit of the concrete in the forms.

b) Transit Mix Plant: 70-100 Revs. @ 5-16 RPM. After initial mixing, agitate mix at 2-5 RPM for the approximate time anticipated from when the water contacts the cement and deposit of the concrete in the forms.

C) Air, Slump, and Water/Cement Ratio (w/c): After aging, the air content of the concrete shall be 6.0% plus or minus 1.5%. The slump and water/cement ratio shall not exceed the following criteria as outlined by Table 2 below:

TABLE 2: 650 PSI CONCRETE

<u>CONCRETE TEMPERATURE</u>	<u>CEMENT MIX</u>		<u>CEMENT FLYASH MIX</u>		<u>IDOT RECOMMENDED DOSAGE of WATER REDUCER</u>
	<u>MAX W/C</u>	<u>MAX SLUMP</u>	<u>MAX W/C</u>	<u>MAX SLUMP</u>	
50-60°F	0.42	3 IN.	0.37	3 IN.	1 TIMES
61-70°F	0.42	2 IN.	0.37	2 IN.	1 TIMES
71-80°F	0.42	1.5 IN.	0.38	1.5 IN.	1 TIMES
81-90°F*	0.42	1 IN.	0.39	1.25 IN.	*1 TIMES

CHECK SHEET #23

91-95°F	0.42	7/8 IN.	0.39	1 IN.	1.5 TIMES
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* At 85°F and above, the dosage of water reducer shall be 1.5 times the recommended dosage. Concrete produced at these temperatures may require the use of Mid Range Water Reducers and/or Retarding admixtures. If shrinkage cracks should develop at any time, the paving operation shall cease until the condition is corrected by the contractor. This may require the use of additional admixtures and/or fog sprayer system on the finishing equipment.

NOTE: The actual water/cement ratio established at the time of the Test Batch shall be the maximum permitted for production concrete. The maximum slump shall be established from TABLE 2 using the actual temperature of the concrete at the time of production. This slump may be exceeded to a maximum limit of 4 inches when approved by the Engineer and by the use of superplasticizer only.

Once the concrete conforms to TABLE 2, beams shall be made for testing at 3,7,14, and 28 days. With permission from the Engineer at the time of the Test Batch, the maximum slump may be exceeded provided the maximum allowable water-cementitious ratio is not exceeded. In addition, the contractor should be aware that if the Test Batch concrete does not obtain 750 PSI at 28 days, a new Test Batch shall be required at the contractor's expense.

- D) The Proportioning Technician shall complete Form AER M-7, Plastic Concrete Air, Slump and Quantity and Form AER M-6, Concrete Moisture Determination (Adjusted Oven Dry Method), to be given to the Resident Engineer after completion of the Test Batch.
- E) The Resident Engineer shall complete Form AER M-4, Concrete Plant Production, Mix Verification.
- F) The concrete test beams shall be tested at 3, 7, 14 and 28 days to establish a growth curve of concrete strength vs. age. The flexural strength shall be at least 100 psi, over the specified strength, at 28 days. . A set of cylinders shall be tested at 28 days.

The Test Batch shall be paid for under Section 501-5.30. Only one Test Batch will be paid for per project. Any additional Test Batches shall be paid for by the contractor.

The contractor shall provide complete facilities for the curing of the beams on the job site. Curing facilities for test beams shall include, but not be limited to, furnishing and operating water tanks equipped with temperature control devices that will automatically maintain the temperature of the water as specified in ASTM C 31. Submersible heaters are acceptable provided the above criteria can be achieved.

501-3.7 FIELD TEST SPECIMENS

Delete the first and second paragraphs and replace with the following:

"Concrete samples shall be taken in the field by the contractor to determine consistency (slump), air content, and strength of the concrete. A minimum of one random flexural strength sample or one random compressive strength sample shall be taken for every 300 cubic yards for acceptance testing. A sample shall consist of two (2) beam breaks for flexural strength testing or two (2) cylinders for compression strength testing. Additional beams or cylinders shall be taken for testing at 3, 7, and 14 days until such time as the Engineer is satisfied that the concrete production, sampling and testing is under control. All samples shall be prepared in accordance with ASTM C 31 and tested in accordance with either ASTM C 39 or ASTM C 78. For flexural strength testing under ASTM C 78, a Rainhart Series 416, Recording Beam Tester or equivalent, shall be required.

501-3.8 MIXING CONCRETE

Delete the first sentence of the second paragraph and replace with the following:

The mixing time shall be 90 seconds. However, the contractor may at his own expense elect to perform a mixer performance test in accordance with Illinois Division of Aeronautics' Policy Memorandum 95-1, Field Test Procedures for Mixer Performance and Concrete Uniformity Tests. The test shall be conducted after issuance of the notice to proceed and in the presence of the Engineer. A maximum of two mixing times shall be considered by the Division.

Add the following as the third sentence of the fourth paragraph:

When a retarding admixture is approved and being used as part of the approved Job Mix Formula, the time elapsed from the time the water is added to the mix until the concrete is deposited in place at the work site shall not exceed 60 minutes when the concrete is hauled in nonagitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators.

501-3.9 LIMITATIONS OF MIXING

Add the following to the fifth paragraph:

When the temperature of the plastic concrete reaches 85°F, the contractor shall make adjustments to maintain the required slump. In no case shall the addition of water raise the water/cementitious ratio above the approved (JMF) water/cementitious ratio. The contractor may have to utilize water reducing and/or retarding admixtures to control slump and initial set. The dosage rate of admixtures shall be determined by the contractor and approved by the Engineer. When the temperature of the plastic concrete reaches 90°F, an approved retarding admixture shall be used. Plastic concrete temperatures up to 96°F, as placed, may be permitted, only when approved by the Division of Aeronautics Engineer of Materials, provided onsite conditions permit placement and finishing without excessive use of water and/or overworking the surface. The occurrence within 24 hours of unusual surface distress shall be cause to revert to a maximum 90°F plastic concrete temperature. Any concrete which in the opinion of the Engineer has a significant amount of surface distress shall be removed and replaced at no extra expense to the

CHECK SHEET #23

contract. Repair of any damaged concrete will be allowed only when approved by the Engineer.

501-3.15 SKID RESISTANT SURFACES

Delete this section.

501-3.17 CURING

(e) Curing in cold weather

Delete this section and replace with the following:

Whenever the ambient air temperature for day or night concreting operations is below 40°F, the contractor shall submit a cold weather concreting plan. The plan shall comply with the Illinois Department of Transportation, Division of Aeronautics, Policy Memorandum 2001-1, REQUIREMENTS FOR COLD WEATHER CONCRETING. Cold weather concrete operations shall not proceed until the Engineer has approved the contractor's cold weather concreting plan.

501-5.1 GENERAL.

Add the following as the second paragraph:

"Section 501-5. Price Adjustment, (A) shall be used to adjust the contract quantity per item when required."

501-5.2 Payment will be made under:

- Item AR501505 -- 5" PCC Pavement -- per square yard.
- Item AR501506 -- 6" PCC Pavement -- per square yard.
- Item AR501507 -- 7" PCC Pavement -- per square yard.
- Item AR501508 -- 8" PCC Pavement -- per square yard.
- Item AR501509 -- 9" PCC Pavement -- per square yard.
- Item AR502510 -- 10" PCC Pavement -- per square yard.
- Item AR502511 -- 11" PCC Pavement -- per square yard.
- Item AR501512 -- 12" PCC Pavement -- per square yard.
- Item AR501513 -- 13" PCC Pavement -- per square yard.
- Item AR501514 -- 14" PCC Pavement -- per square yard.
- Item AR501515 -- 15" PCC Pavement -- per square yard.
- Item AR501516 -- 16" PCC Pavement -- per square yard.
- Item AR501517 -- 17" PCC Pavement -- per square yard.
- Item AR501518 -- 18" PCC Pavement -- per square yard.
- Item AR501519 -- 19" PCC Pavement -- per square yard.
- Item AR501520 -- 20" PCC Pavement -- per square yard.
- Item AR501530 -- PCC Test Batch -- per each.

501-5.3 PRICE ADJUSTMENT

Delete the word price in the first sentence of (A) thickness adjustment and Table 3 and replace with the word “quantity”.

Add the following to the first paragraph:

“The contractor shall cut three cores per lot to determine the adjustment for thickness. The location of the core shall be randomly determined by the Resident Engineer. All holes shall be filled by the contractor with a non shrink grout approved by the Engineer. All associated costs shall be borne by the contractor.

Delete (B) Flexural Strength Adjustment and (C) Compressive Strength Adjustment.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR 501002 PORTLAND CEMENT CONCRETE PAVEMENT – METHOD II
(Over 1,500 and up to 15,000 cubic yards)

Effective: January 1, 2003

This Special Provision Modifies Item 501 Portland Cement Concrete Pavement of the Standard Specifications.

501-1.1 Delete the first paragraph and replace with the following:

"This work shall consist of pavement composed of Portland Cement concrete, or pavement composed of Portland Cement concrete with partial replacement of cement with fly ash only, or with partial replacement of cement with Ground Granulated Blast-furnace (GGBF) slag only, with or without reinforcement, constructed on a prepared subgrade, subbase, or base course in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross sections on the plans.

501-2.1 FINE AGGREGATE

Delete the first sentence and replace with the following:

"Fine aggregate shall be defined as follows:

Sand. Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles and shall meet the following quality requirements:"

QUALITY TEST(IDOT A Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	10
Minus No. 200 Sieve Mat'l ASTM C 136 Max. %	3

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	1.0
Coal, Lignite & Shells %	1.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>3.0</i>

501-2.2 COARSE AGGREGATE

Delete this Section and replace with the following:

"Coarse aggregate shall be a non "D" cracking crushed stone as determined by the Department of Transportation.

Crushed stone. Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

The coarse aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT A Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	45
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	1 <u>1/</u>

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	1.0
Clay Lumps %	0.25
Coal, Lignite & Shells %	0.25
Conglomerate %	4.0
Other Deleterious %	4.0 <u>2/</u>
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

1/ NOTE: If the material finer than the No. 200 sieve consists of dust from the fracture, essentially free from clay or silt, this percentage may be increased to 2.5%.

2/ NOTE: Includes deleterious chert. Deleterious chert shall be the lightweight fraction separated in a 2.55 heavy media separation.

Delete Table 2 and use the following gradations:

Sieve	$\frac{3}{4}$ " – No. 4	1" – No. 4
2	--	--
1 $\frac{1}{2}$	--	100
1	100	90-100
$\frac{3}{4}$	84-100	--
$\frac{1}{2}$	30-60	30-60
No. 4	0-12	0-10
No. 16	--	--

IDOT Gradation

(CA-11)

(CA-07)

501-2.3 CEMENT

Delete this section and replace with the following:

501-2.3 Cementitious Material

- (a) Cement. Type I cement conforming to the requirements of ASTM C 150 shall be required.
- (b) Fly Ash. The fly ash shall meet the requirements of ASTM C 618, for Class C fly ash. The fly ash source shall be approved by the Department of Transportation, and the conditions outlined by Policy Memorandum No. 88-1, Quality Control Requirements For Fly Ash For Use In Portland Cement Concrete, effective January 1, 1988, or latest edition, as issued by IDOT Bureau of Materials and Physical Research. Fly ash shall not be used in concrete mixtures after October 15 nor before April 1 unless the contractor demonstrates, by preparing a Test Batch, a 14 day strength no less than that obtained from the equivalent cement-only mix. The test batch for both the fly ash and cement-only mix shall be prepared in accordance with 501-3.6(A) or 501-3.6(B) and shall be constructed at no additional expense to the contract.
- (c) Ground Granulated Blast-furnace Slag.

The Ground Granulated Blast-furnace Slag (GGBF) shall consist of the glassy granular material formed when molten blast-furnace slag is rapidly chilled, and then finely ground. Type 1S portland blast-furnace slag cement or Type 1 (SM) slag-modified portland cement may be used at the option of the contractor provided the slag constituent does not exceed 25% of the mass (weight) of the portland blast-furnace slag cement. Portland blast-furnace slag cements shall not be used after October 15th nor before April 1st. The GGBF slag shall meet the standard physical and chemical requirements of AASHTO M-302, for grade 100 or grade 120 material. The GGBF slag shall meet the requirements of the Department's latest Policy Memorandum, Acceptance Procedure of Finely Divided Minerals Used in Portland Cement Concrete and Other Applications. The GGBF slag must come from one of the approved suppliers on the Department's latest Annual List of Approved Suppliers of GGBF slag for P.C. Concrete. A Job Mix Formula (JMF) with portland cement, flyash, and GGBF slag will not be allowed for use on the project unless approved by the Engineer. GGBF slag shall not be used in concrete mixtures when the air temperature is below 40°F. Different sources or grades of GGBF slag shall not be mixed or used alternately in the same item of construction.

501-2.7 DOWEL AND TIE BARS

Replace the second paragraph with the following:

Dowel bars shall be plain, round steel bars conforming to the requirements of AASHTO M227 Grades 70 through 80. The finished bars shall be saw cut and free from burrs or out-of-round ends which will prevent their slipping easily in the concrete. The bars shall be epoxy coated according to the requirements of AASHTO M254.

501-2.10 ADMIXTURES

Delete "(a) Pozzolan Admixtures", "(b) Air-Entraining Admixtures", "(c) Water-Reducing Admixtures" and add the following to the first paragraph:

"Air-Entraining Admixture and Water-Reducing Admixtures shall be required. Retarding admixtures may be used when approved by the Engineer. High Range Water Reducer may be required to achieve the workability needed by the contractor. The use of High Range Water Reducer shall be at no extra expense to the contract. All admixtures shall be approved by the Engineer."

(a) Air Entraining Admixtures

"Air-entraining admixtures approved by the Department of Transportation shall be used."

(b) Water-reducing Admixtures

"Water-reducing admixtures approved by the Department of Transportation shall be used."

(c) Retarding Admixtures

"Retarding admixtures approved by the Department of Transportation shall be used."

(d) High Range Water-Reducing Admixtures

"High range Water-reducing admixtures approved by the Department of Transportation shall be used."

501-2.11 CHEMICAL ADHESIVES

When it is necessary to anchor dowel and/or tie bars to hardened concrete, a chemical adhesive shall be used. The chemical adhesive resin system shall consist of a 2-part, fast setting resin and filler/hardener, and must be on the Illinois Department of Transportation's most recent Approved Chemical Adhesives List. (the latest list is available through the Materials Section of the Division of Aeronautics.). the adhesive shall be mixed in accordance with the manufacturer's instructions. After drilling, the hole shall be blown out with compressed air to remove any dust. The hole shall also be dry before installing dowel or tie bars. The adhesive shall be injected into the hole in a manner that fills from the back of the hole to approximately one third of its depth. When the bar is inserted, the quantity of adhesive shall be such that a small amount leaks out of the front of the hole. The Division of Aeronautics retains the right to test the chemical adhesive and the method of installation as a condition of approval.

CHECK SHEET #24

501-3.1 EQUIPMENT

Add the following to the first paragraph:

"The concrete plant(s) shall conform to the following requirements or the Engineer may accept the use of a concrete plant approved by the IDOT Division of Highways, in accordance with Section 1103 of the Standard Specifications for Road and Bridge Construction."

Add the following as a second paragraph under (a) Batching Plant and Equipment, (1) General:

"The Batching Plant shall be a computerized plant interfaced with a printer and shall print actual batch weights, added water, tempering water, mixing time, and amount of each additive per batch."

Add the following as a second paragraph under (a) Batching Plant and Equipment, (2) Bins and Hopper:

"Cement and fly ash shall be stored in separate bins. When a manual plant is utilized, cement and fly ash shall be weighed in a separate weigh hopper. When an automatic batching plant is utilized, the fly ash may be weighed into the cement weigh hopper."

Add the following as (3) under (c) Finishing Equipment

- (3) When the project has a concrete quantity greater than or equal to 5000 cubic yards, fogging equipment shall be available for use during the paving operations. Use of the fogging equipment shall be required when the rate of evaporation from the surface of the concrete exceeds 0.2 lb./sq. ft./hr. or as directed by the Engineer. The evaporation rate shall be determined according to the figure in the Portland Cement Association's publication titled "Design and Control of Concrete Mixtures". Refer to the section on plastic shrinkage cracking. The publication is provided in the Portland Cement Concrete Level I technician course, or it can be obtained from the Portland Cement Association. Fogging equipment shall consist of a mechanically operated pressurized system using a triple headed nozzle or an equivalent nozzle. The fogging nozzle shall be capable of producing a fine fog mist that will increase the relative humidity of the air just above the fresh concrete surface without accumulating any water on the concrete. The fogging equipment shall be mounted on either the finishing equipment or a separate work bridge behind the finishing equipment. Controls shall be designed to vary the water flow, shall be easily accessible, and shall immediately shut off the water when in the off position. Hand held fogging equipment will not be allowed.

501-3.5 HANDLING, MEASURING AND BATCHING MATERIAL

Add the following to the first paragraph:

"Loading out from stockpiles for purposes of batching, shall be accomplished in a systematic manner to minimize highly variable moisture contents. After

concrete production begins, the contractor shall load out of an established stockpile while the others are constructed.”

Add the following to the sixth paragraph:

“The air entrainment and water reducing admixtures shall be incorporated into the batch water stream during the batching process. Each additive must be added separately to the mixing water, with no intermixing of additives.”

501-3.6(A) PROPORTIONS

Delete the first paragraph and replace with the following:

"Proportioning requirements for the concrete shall be designed for a field compressive strength of 4000 psi at 28 days for pavements designed for aircraft weighing less than 60,000 pounds". The Contractor shall note that to ensure that not more than 10 percent of the concrete actually produced will fall below the specified strength, the mix design average strength must be considerably higher than the specified strength. The concrete strength necessary to meet specification requirements depends on the producer's standard deviation of compressive test results and the accuracy which that value can be estimated from historic data for the same or similar materials.

Delete the second paragraph and replace with the following:

"Prior to the start of paving operations and after approval of all materials to be used in the manufacture of the concrete, the Engineer will provide the mix design based on the IDOT computer generated mix design system. The contractor may submit his own mix design with substantiating test data subject to approval by the Engineer. The mix design shall produce a compressive strength of at least 800 psi over the specified field strength. Test specimens shall be required to verify mix design parameters. Compressive strength shall be as specified at 28 days using test specimens prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 39."

The contractor shall be required to provide all Quality Control personnel for the manufacture of the concrete. Quality Control shall be performed in accordance with the Division of Aeronautics' Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture. The use of a microwave moisture probe or equal for purposes of determining the percent moisture in the fine aggregate may be allowed when approved by the Engineer. The microwave moisture probe must be interfaced with the plant batching computer. The percent of free moisture (Above Saturated Surface Dry Moisture) and the adjusted fine aggregate batch weight must be determined by the microwave moisture probe and indicated on the computer screen for each batch. As part of the approval process, the contractor shall obtain a minimum of 10 samples of fine aggregate within the proximity at which the probe is fixed below the fine aggregate bin. The contractor shall determine the percent moisture (Above Saturated Surface Dry Moisture) by the Adjusted Oven Dry Method, the Chapman Flask, the Pycnometer Jar Method or the Dunagan Method for each sample. A correlation shall then be established between the contractor's results and the corresponding percent moisture indicated by the microwave moisture probe for each sample taken. If necessary, adjustments to the microwave probe should

be made so that the correct percent moisture is utilized during the batching process. The calibration procedure described herein shall be completed in the presence of and witnessed by the Resident Engineer.

Delete the fifth paragraph and replace with the following:

"The cement content specified in this paragraph is a minimum. If the results of the Test Batch strength testing fail to meet the requirements of the contract, the contractor may have to increase the cement content, select different material sources, or some combination of these or other mix design adjustments. Additional costs for increased cement or other adjustments necessary to produce an acceptable mix shall be borne by the contractor. The cement content shall not be less than 6.5 sacks (611 lbs.) per cubic yard. However, if the contractor can demonstrate that the selected course aggregate gradation has a minimum of 50 percent passing the ½ inch sieve, the minimum cement content may be reduced to 6.25 sacks (588 lbs.) per cubic yard. As a minimum for approval, the contractor shall provide 10 recent gradation tests on aggregate taken from the proposed course aggregate stockpile intended for use in the project. All ten gradation test results must meet the 50% passing the ½ inch sieve requirement in addition to meeting the rest of the CA-7 or CA-11 specification. In order to achieve 50% passing the ½ inch sieve, combining aggregate sizes will be permitted. Two or more aggregate sizes consisting of IDOT gradations CA-7, CA-11, CA-13, CA14, and CA-16 of the same coarse aggregate quality requirements specified under section 501-2.2 may be combined. However a CA-7 or CA-11 shall be included in the blend. The mathematically combined coarse aggregate gradation shall be determined in the same manner as for a coarse and fine aggregate blend, which is discussed in the most current edition of the "Portland Cement Concrete Level II Technician Course" manual. Each size shall be stored separately and care shall be taken to prevent them from being mixed until they are ready to be proportioned. The contractor will be permitted to mix more than two sizes of coarse aggregate, provided the separate sizes selected and the proportions used in combining them are approved by the Engineer and that separate compartments are provided to proportion each size.

When Class C fly ash is used, the amount of cement replaced shall not exceed 20 percent by mass (weight) or 122 pounds, at a replacement ratio of 1.25 to 1 (fly ash: cement replaced). Fly ash and cement weights will be rounded up to the nearest 5 lbs. in the mix design. For cement-fly ash mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag : cement replaced) shall be a 1 to 1 replacement for Grade 100 or Grade 120. For cement-GGBF slag mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. Measurements of GGBF slag and cement shall be rounded up to the nearest 5 lbs. in the mix design.

Add the following three paragraphs after the last paragraph of this Section.

"Test Batch. At least 28 days prior to the start of production the contractor and/or producer shall prepare a Test Batch under the direction of the Engineer. The Test Batch shall be prepared at the concrete plant proposed for use in the production of the concrete mix for the project and shall be in accordance with

the approved Job Mix Formula (JMF). When approved by the Engineer, the Test Batch may be prepared at a different plant provided that the same materials specified in the JMF are used. In addition, the proposed Test Batch plant must meet the plant requirements specified herein. If more than one (JMF) is required as a result of different sources of materials, additional test batches shall be conducted for each (JMF) as outlined herein. The cost for each additional test batch shall be borne by the contractor. The plant shall have been surveyed and approved by the Engineer prior to preparation of the Test Batch. As required by these Special Provisions the contractor shall provide all Quality Control for production of the concrete. The Test Batch shall be prepared as follows:

1. Proportioning. Prior to preparation of the mix, the Proportioning Technician shall perform a minimum of two (2) gradation analysis and two (2) moisture tests on each aggregate used. In order to obtain representative aggregate moisture, the contractor shall construct a small stockpile for both the coarse and fine aggregates. The small stockpiles shall contain enough material to manufacture as many test batches as the contractor decides to make. An aggregate sample shall be obtained from each small stockpile using proper aggregate sampling techniques for obtaining a representative sample. The free moisture for each aggregate shall be determined. From this data, the JMF shall be adjusted for moisture, as outlined in IDOT's Manual of Instructions for Concrete Proportioning and Testing.
2. Preparation of the Mix:
 - A) Prepare a Test Batch Batch that is at least one-half (1/2) the manufacturer's rated capacity of the mixing drum (in cubic yards). The Test Batch shall be prepared in accordance with the approved JMF, adjusted for moisture.
 - B) Mixing requirements shall be:
 - a) Central Mix Plant: Minimum of 90 seconds. If transit mixer trucks are used to transport the mix, the mix shall be agitated, after mixing, at 2-5 RPM for the approximate travel time anticipated between batching at the plant and deposit of the concrete in the forms. If non-mixing trucks are used to transport the mix, the mix shall remain in the central mixer with no mixing or agitation for the approximate time anticipated from when the water contacts the cement and deposit of the concrete in the forms.
 - b) Transit Mix Plant: 70-100 Revs. @ 5-16 RPM. After initial mixing, agitate mix at 2-5 RPM for the approximate time anticipated from when mixing is complete and deposit of the concrete in the forms.
 - C) Air, Slump, and Water/Cement Ratio (w/c): After aging, the air content of the concrete shall be 6.0% plus or minus 1.5%. The slump and water/cement ratio shall not exceed the following criteria as outlined by Table 1 below:

TABLE 1: 4000 PSI CONCRETE

<u>CONCRETE TEMPERATURE</u>	<u>CEMENT MIX</u>		<u>CEMENT FLYASH MIX</u>		<u>IDOT RECOMMENDED DOSAGE of WATER REDUCER</u>
	<u>MAX W/C</u>	<u>MAX SLUMP</u>	<u>MAX W/C</u>	<u>MAX SLUMP</u>	
50-60°F	0.44	4 IN.	0.40	4 IN.	1 TIMES
61-70°F	0.44	4 IN.	0.40	4 IN.	1 TIMES
71-80°F	0.44	3 IN.	0.41	3 IN.	1 TIMES
81-90°F*	0.44	2 IN.	0.42	2 IN.	*1 TIMES
91-95°F	0.44	1.5 IN.	0.42	1.5 IN.	1.5 TIMES

* At 85°F and above, the dosage of water reducer shall be 1.5 times the recommended dosage. Concrete produced at these temperatures may require the use of Mid Range Water Reducers and/or Retarding admixtures. If shrinkage cracks should develop at any time, the paving operation shall cease until the condition is corrected by the contractor. This may require the use of additional admixtures and/or the use of a fog sprayer system on the finishing equipment.

NOTE: The actual water/cement ratio established at the time of the Test Batch shall be the maximum permitted for production concrete. The maximum slump shall be established from TABLE 1 using the actual temperature of the concrete at the time of production. This slump may be exceeded to a maximum limit of 4 inches when approved by the Engineer and by the use of superplasticizer only.

Once the concrete conforms to TABLE 1, cylinders shall be made for testing at 3,7,14, and 28 days. With permission from the Engineer at the time of the Test Batch, the maximum slump may be exceeded provided the maximum allowable water-cementitious ratio is not exceeded. In addition, the contractor should be aware that if the Test Batch concrete does not obtain 4800 PSI at 28 days, a new Test Batch shall be required at the contractor's expense.

- D) The Proportioning Technician shall complete Form AER M-7, Plastic, Concrete Air, Slump and Quantity and Form AER M-6, Concrete Moisture Determination (Adjusted Oven Dry Method), to be given to the Resident Engineer after completion of the Test Batch.
- E) The Resident Engineer shall complete Form AER M-4, Concrete Plant Production, Mix Verification.
- F) The concrete test cylinders shall be tested at 3, 7, 14 and 28 days to establish a growth curve of concrete strength vs. age. The compressive strength shall be at least 800 psi, over the specified strength, at 28 days.

The Test Batch shall be paid for under Section 501-5.30. Only one Test Batch will be paid for per project. Any additional Test Batches shall be paid for by the contractor.

The contractor shall provide complete facilities for the curing of the cylinders on the job site. Curing facilities for test cylinders shall include, but not be limited to, furnishing and operating water tanks equipped with temperature control devices that will automatically maintain the temperature of the water as specified in ASTM C 31. Submersible heaters are acceptable provided the above mentioned criteria are achieved.

502-3.6 (B) PROPORTIONS

Delete the first paragraph and replace with the following:

"Proportioning requirements for concrete shall be designed for a field flexural strength of 650 psi at 28 days for pavements designed for aircraft weighing 60,000 pounds or more". The Contractor shall note that to ensure that not more than 10 percent of the concrete actually produced will fall below the specified strength, the mix design average strength must be higher than the specified strength. The concrete strength necessary to meet specification requirements depends on the producer's standard deviation of flexural test results and the accuracy which that value can be estimated from historic data for the same or similar materials.

Delete the second paragraph and replace with the following:

"Prior to the start of paving operations and after approval of all materials to be used in the manufacture of the concrete, the Engineer will provide the mix design based on the IDOT computer generated mix design system. The contractor may submit his own mix design with substantiating test data subject to approval by the Engineer. The mix design shall produce a flexural strength of at least 100 psi over the specified field strength. Test specimens shall be required to verify mix design parameters. Flexural strength shall be as specified at 28 days using test specimens prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 78. For side form concrete, superplasticizer shall be required."

The contractor shall be required to provide all Quality Control personnel for the manufacture of the concrete. Quality Control shall be performed in accordance with the Division of Aeronautics' Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture. The use of a microwave moisture probe for purposes of determining the percent moisture in the fine aggregate may be allowed when approved by the Engineer. The microwave moisture probe must be interfaced with the plant batching computer. The percent of free moisture (Above Saturated Surface Dry Moisture) and the adjusted fine aggregate batch weight must be determined by the microwave moisture probe and indicated on the computer screen for each batch. As part of the approval process, the contractor shall obtain a minimum of 10 samples of fine aggregate within the proximity at which the probe is fixed below the fine aggregate bin. The contractor shall determine

CHECK SHEET #24

the percent moisture (Above Saturated Surface Dry Moisture) by the Adjusted Oven Dry Method, the Chapman Flask, the Pycnometer Jar Method or the Dunagan Method for each sample. A correlation shall then be established between the contractor's results and the corresponding percent moisture indicated by the microwave moisture probe for each sample taken. If necessary, adjustments to the microwave probe should be made so that the correct percent moisture is utilized during the batching process. The calibration procedure described herein shall be completed in the presence of, and witnessed by the Resident Engineer.

Delete the fifth paragraph and replace with the following:

"The cement content specified in this paragraph is a minimum. If the results of the Test Batch strength testing fail to meet the requirements of the contract, the contractor may have to increase the cement content, select different material sources, or some combination of these or other mix design adjustments. Additional costs for increased cement or other adjustments necessary to produce an acceptable mix shall be borne by the contractor. The cement content shall not be less than 6.5 sacks (611 lbs.) per cubic yard. However, if the contractor can demonstrate that the selected course aggregate gradation has a minimum of 50 percent passing the ½ inch sieve, the minimum cement content may be reduced to 6.25 sacks (588 lbs.) per cubic yard. As a minimum for approval, the contractor shall provide 10 recent gradation tests on aggregate taken from the proposed course aggregate stockpile intended for use in the project. All ten gradation test results must meet the 50% passing the ½ inch sieve requirement in addition to meeting the rest of the CA-7 or CA-11 specification. In order to achieve 50% passing the ½ inch sieve, combining aggregate sizes will be permitted. Two or more aggregate sizes consisting of IDOT gradations CA-7, CA-11, CA-13, CA14, and CA-16 of the same coarse aggregate quality requirements specified under section 501-2.2 may be combined. However a CA-7 or CA-11 shall be included in the blend. The mathematically combined coarse aggregate gradation shall be determined in the same manner as for a coarse and fine aggregate blend, which is discussed in the most current edition of the "Portland Cement Concrete Level II Technician Course" manual. Each size shall be stored separately and care shall be taken to prevent them from being mixed until they are ready to be proportioned. The contractor will be permitted to mix more than two sizes of coarse aggregate, provided the separate sizes selected and the proportions used in combining them are approved by the Engineer and that separate compartments are provided to proportion each size.

When Class C fly ash is used, the amount of cement replaced shall not exceed 20% by mass (weight) or 122 pounds, at a replacement ratio of 1.25 to 1 (fly ash: cement replaced). Fly ash and cement weights will be rounded up to the nearest 5 lbs. in the mix design. For cement-fly ash mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag : cement replaced) shall be a 1 to 1 replacement for Grade 100 or Grade 120. For cement-GGBF slag mixes, the water/cement ratio will be based on the total cementitious material

contained in the mix. Measurements of GGBF slag and cement shall be rounded up to the nearest 5 lbs. in the mix design.

Add the following paragraph after the last paragraph of this Section.

"Test Batch. At least 28 days prior to the start of production the contractor and/or producer shall prepare a Test Batch under the direction of the Resident Engineer. The Test Batch shall be prepared at the concrete plant proposed for use in the production of the concrete mix for the project and shall be in accordance with the approved Job Mix Formula (JMF). When approved by the Engineer, the Test Batch may be prepared at a different plant provided that the same materials specified in the (JMF) are used. In addition, the proposed Test Batch plant must meet the plant requirements specified herein. If more than one (JMF) is required as a result of different sources of materials, additional test batches shall be conducted for each (JMF) as outlined herein. The cost for each additional test batch shall be borne by the contractor. The plant shall have been surveyed and approved by the Engineer prior to preparation of the Test Batch. As required by these Special Provisions the contractor shall provide all Quality Control for production of the concrete. The contractor shall have his Quality Control Officer and a representative of the contractor familiar with the paving operation, present at the test batch preparation. The Test Batch shall be prepared as follows:

1. Proportioning. Prior to preparation of the mix, the Proportioning Technician shall perform a minimum of two (2) gradation analysis and two (2) moisture tests on each aggregate used. In order to obtain representative aggregate moisture, the contractor shall construct a small stockpile for both the coarse and fine aggregates. The small stockpiles shall contain enough material to manufacture as many test batches as the contractor decides to make. An aggregate sample shall be obtained from each small stockpile using proper aggregate sampling techniques for obtaining a representative sample. The free moisture for each aggregate shall be determined. From this data, the (JMF) shall be adjusted for moisture, as outlined in IDOT's Manual of Instructions for Concrete Proportioning and Testing.
2. Preparation of the Mix:
 - A) Prepare a minimum Test Batch that is at least one-half (1/2) the manufacturer's rated capacity of the mixing drum (in cubic yards). The Test Batch shall be prepared in accordance with the approved (JMF), adjusted for moisture.
 - B) Mixing requirements shall be:
 - a) Central Mix Plant: Minimum of 90 seconds. If transit mixer trucks are used to transport the mix, the mix shall be agitated, after mixing, at 2-5 RPM for the approximate travel time anticipated between batching at the plant and deposit of the concrete in the forms.

CHECK SHEET #24

If non-mixing trucks are used to transport the mix, the mix shall remain in the central mixer with no mixing or agitation for the approximate time anticipated from when the water contacts the cement and deposit of the concrete in the forms.

- b) Transit Mix Plant: 70-100 Revs. @ 5-16 RPM. After initial mixing, agitate mix at 2-5 RPM for the approximate time anticipated from when the water contacts the cement and deposit of the concrete in the forms.
- c) Air, Slump, and Water/Cement Ratio (w/c): After aging, the air content of the concrete shall be 6.0% plus or minus 1.5%. The slump and water/cement ratio shall not exceed the following criteria as outlined by Table 2 below:

TABLE 2: 650 PSI CONCRETE

<u>CONCRETE TEMPERATURE</u>	<u>CEMENT MIX</u>		<u>CEMENT FLYASH MIX</u>		<u>IDOT RECOMMENDED DOSAGE of WATER REDUCER</u>
	<u>MAX W/C</u>	<u>MAX SLUMP</u>	<u>MAX W/C</u>	<u>MAX SLUMP</u>	
50-60°F	0.42	3 IN.	0.37	3 IN.	1 TIMES
61-70°F	0.42	2 IN.	0.37	2 IN.	1 TIMES
71-80°F	0.42	1.5 IN.	0.38	1.5 IN.	1 TIMES
81-90°F*	0.42	1 IN.	0.39	1.25 IN.	*1 TIMES
91-95°F	0.42	7/8 IN.	0.39	1 IN.	1.5 TIMES

* At 85°F and above, the dosage of water reducer shall be 1.5 times the recommended dosage. Concrete produced at these temperatures may require the use of Mid Range Water Reducers and/or Retarding admixtures. If shrinkage cracks should develop at any time, the paving operation shall cease until the condition is corrected by the contractor. This may require the use of additional admixtures and/or fog sprayer system on the finishing equipment.

NOTE: The actual water/cement ratio established at the time of the Test Batch shall be the maximum permitted for production concrete. The maximum slump shall be established from TABLE 2 using the actual temperature of the concrete at the time of production. This slump may be exceeded to a maximum limit of 4 inches when approved by the Engineer and by the use of superplasticizer only.

Once the concrete conforms to TABLE 2, beams shall be made for testing at 3,7,14, and 28 days. With permission from the Engineer at the time of the Test Batch, the maximum slump may be exceeded provided the maximum allowable water-cementitious ratio is not exceeded. In addition, the contractor should be aware that if the Test Batch concrete does not obtain 750 PSI at 28 days, a new Test Batch shall be required at the contractor's expense.

- D) The Proportioning Technician shall complete Form AER M-7, Plastic Concrete Air, Slump and Quantity and Form AER M-6, Concrete Moisture Determination (Adjusted Oven Dry Method), to be given to the Resident Engineer after completion of the Test Batch.
- E) The Resident Engineer shall complete Form AER M-4, Concrete Plant Production, Mix Verification.
- F) The concrete test beams shall be tested at 3, 7, 14 and 28 days to establish a growth curve of concrete strength vs. age. The flexural strength shall be at least 100 psi, over the specified strength, at 28 days. . A set of cylinders shall be tested at 28 days.

The Test Batch shall be paid for under Section 501-5.30. Only one Test Batch will be paid for per project. Any additional Test Batches shall be paid for by the contractor.

The contractor shall provide complete facilities for the curing of the beams on the job site. Curing facilities for test beams shall include, but not be limited to, furnishing and operating water tanks equipped with temperature control devices that will automatically maintain the temperature of the water as specified in ASTM C 31. Submersible heaters are acceptable provided the above criteria can be achieved.

501-3.7 FIELD TEST SPECIMENS

Delete the first and second paragraphs and replace with the following:
 "Concrete samples shall be taken in the field by the contractor to determine consistency (slump), air content, and strength of the concrete. A minimum of one random flexural strength sample or one random compressive strength sample shall be taken for every 300 cubic yards for acceptance testing. A sample shall consist of two (2) beam breaks for flexural strength testing or two (2) cylinders for compression strength testing. Additional beams or cylinders shall be taken for testing at 3, 7, and 14 days until such time as the Engineer is satisfied that the concrete production, sampling and testing is under control. All samples shall be prepared in accordance with ASTM C 31 and tested in accordance with either ASTM C 39 or ASTM C 78. For flexural strength testing under ASTM C 78, a Rainhart Series 416, Recording Beam Tester or equivalent, shall be required.

501-3.8 MIXING CONCRETE

Delete the first sentence of the second paragraph and replace with the following:

The mixing time shall be 90 seconds. However, the contractor may at his own expense elect to perform a mixer performance test in accordance with Illinois Division of Aeronautics' Policy Memorandum 95-1, Field Test Procedures for Mixer Performance and Concrete Uniformity Tests. The test shall be conducted after issuance of the notice to proceed and in the presence of the Engineer. A maximum of two mixing times shall be considered by the Division.

Add the following as the third sentence of the fourth paragraph:

When a retarding admixture is approved and being used as part of the approved Job Mix Formula, the time elapsed from the time the water is added to the mix until the concrete is deposited in place at the work site shall not exceed 60 minutes when the concrete is hauled in nonagitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators.

501-3.9 LIMITATIONS OF MIXING

Add the following to the fifth paragraph:

When the temperature of the plastic concrete reaches 85°F, the contractor shall make adjustments to maintain the required slump. In no case shall the addition of water raise the water/cementitious ratio above the approved (JMF) water/cementitious ratio. The contractor may have to utilize water reducing and/or retarding admixtures to control slump and initial set. The dosage rate of admixtures shall be determined by the contractor and approved by the Engineer. When the temperature of the plastic concrete reaches 90°F, an approved retarding admixture shall be used. Plastic concrete temperatures up to 96°F, as placed, may be permitted provided onsite conditions permit placement and finishing without excessive use of water and/or overworking the surface. The occurrence within 24 hours of unusual surface distress shall be cause to revert to a maximum 90°F plastic concrete temperature. Any concrete which in the opinion of the Engineer has a significant amount of surface distress shall be removed and replaced at no extra expense to the contract. Repair of any damaged concrete will be allowed only when approved by the Engineer.

501-3.15 SKID RESISTANT SURFACES

Delete this section.

501-3.17 CURING

(e) Curing in cold weather

Delete this section and replace with the following:

Whenever the ambient air temperature for day or night concreting operations is below 40°F, the contractor shall submit a cold weather concreting plan. The plan shall comply with the Illinois Department of Transportation, Division of Aeronautics, Policy Memorandum 2001-1, REQUIREMENTS FOR COLD WEATHER CONCRETING. Cold weather concrete operations shall not proceed until the Engineer has approved the contractor's cold weather concreting plan.

501-5.1 GENERAL

Delete this section and replace with the following:

"The quantity of Portland Cement Concrete Pavement measured as outlined in Section 501-4.1 shall be adjusted in accordance with Section 501-5.3 Price Adjustment as specified herein. Payment shall be calculated by multiplying the contract unit price per square yard of completed pavement and the adjusted square yards per LOT. Final payment shall be full compensation for furnishing and placing all materials, including any dowels, steel reinforcement, joint materials, and texturing, except for saw-cut grooving. This also includes payment for all Quality Control Engineering.

The Test Batch shall be paid at the contract unit price per each, which price shall include all material, equipment, labor and engineering necessary to complete this section.

501-5.2 Payment will be made under:

- Item AR501505 -- 5" PCC Pavement -- per square yard.
- Item AR501506 -- 6" PCC Pavement -- per square yard.
- Item AR501507 -- 7" PCC Pavement -- per square yard.
- Item AR501508 -- 8" PCC Pavement -- per square yard.
- Item AR501509 -- 9" PCC Pavement -- per square yard.
- Item AR502510 -- 10" PCC Pavement -- per square yard.
- Item AR502511 -- 11" PCC Pavement -- per square yard.
- Item AR501512 -- 12" PCC Pavement -- per square yard.
- Item AR501513 -- 13" PCC Pavement -- per square yard.
- Item AR501514 -- 14" PCC Pavement -- per square yard.
- Item AR501515 -- 15" PCC Pavement -- per square yard.
- Item AR501516 -- 16" PCC Pavement -- per square yard.
- Item AR501517 -- 17" PCC Pavement -- per square yard.
- Item AR501518 -- 18" PCC Pavement -- per square yard.
- Item AR501519 -- 19" PCC Pavement -- per square yard.
- Item AR501520 -- 20" PCC Pavement -- per square yard.
- Item AR501530 -- PCC Test Batch -- per each.

501-5.3 PRICE ADJUSTMENT

Delete the word price in the first sentence of (A) Thickness Adjustment and Table 3 and replace with the word quantity.

Add the following to the first paragraph:

"The contractor shall cut three cores per lot to determine the adjustment for thickness. The location of the core shall be randomly determined by the

CHECK SHEET #24

Resident Engineer. All holes shall be filled by the contractor with a non shrink grout approved by the Engineer. All associated costs shall be borne by the contractor.”

Delete (B) Flexural Strength Adjustment and (C) Compressive Strength Adjustment and replace with the following:

(B) Flexural or Compressive Strength Adjustment

Acceptance of the pavement shall be on a LOT basis using the flexural or compressive strengths obtained from test specimens prepared and tested in accordance with Section 501-3.7, Field Test Specimens, specified herein. There shall be no mixing of mix designs in the same lot.

1. LOT Size. A LOT shall consist of the average of four (4) SUBLOT samples, but shall not exceed six (6) SUBLOTS. The minimum number of sublots per lot shall be three (3).

(a) A SUBLOT shall consist of the equivalent square yards of pavement required to place 300 cubic yards of concrete. All samples used to determine acceptance of the pavement shall be tested at 28 days.

2. LOT Early Termination. When less than three (3) SUBLOTS are produced, such as the end of construction of the pavement or at the end of the construction season, the final SUBLOT tests shall be included with the previous LOT for payment. The final LOT may thus contain up to six (6) SUBLOTS.

3. Acceptance Criteria. The acceptance of each LOT of concrete pavement shall be based on the Percentage of concrete Within specification Limits (PWL). The PWL is determined using standard statistical techniques which involves the flexural or compressive strength acceptance tests from each LOT and the Quality Index. The Quality Index is calculated using one of the following formulae:

FLEXURAL TEST	COMPRESSIVE TEST
$Q = \frac{\bar{X} - 650PSI}{S}$	$Q = \frac{\bar{X} - 4000PSI}{S}$

Where Q = Quality Index

\bar{X} = Mean (average) of the SUBLOT flexural or compressive strength tests.

S = Standard Deviation of SUBLOT flexural or compressive strength tests.

The PWL is determined by entering Table 4 with the "Q" using the column for the appropriate number (N) of flexural or compressive strength LOT tests. Each LOT of concrete pavement shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When a LOT is below 90 percent, the LOT square yards shall be adjusted in accordance with Table 5.

TABLE 5 PAY ADJUSTMENT SCHEDULE (see note 2/)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	1.

1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.
 2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.
- (C) Resampling and Retesting. The contractor may request resampling and retesting in accordance with the latest version of the Division of Aeronautics Policy Memorandum 90-1,

CHECK SHEET #24

TABLE 4
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX Q

PERCENT WITHIN TOLERANCE	-----									
	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789	1.0788	1.0787
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382	1.0377	1.0374
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990	0.9982	0.9976
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643	0.9624	0.9610	0.9599	0.9591
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241	0.9228	0.9219
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.0928	0.8901	0.8882	0.8868	0.8857
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533	0.8517	0.8505
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192	0.8175	0.8161
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858	0.7840	0.7826
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531	0.7513	0.7498
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211	0.7192	0.7177
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896	0.6877	0.6861
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587	0.6567	0.6551
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282	0.6262	0.6247
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982	0.5962	0.5947
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686	0.5667	0.5651
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454	0.5419	0.5394	0.5375	0.5360
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105	0.5086	0.5072
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820	0.4802	0.4787
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537	0.4520	0.4506
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310	0.4280	0.4257	0.4241	0.4227
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031	0.4001	0.3980	0.3964	0.3951
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705	0.3690	0.3678
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432	0.3418	0.3407
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161	0.3148	0.3137
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892	0.2880	0.2870
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624	0.2613	0.2604

TABLE 4 (Continued)
 TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
 (STANDARD DEVIATION METHOD)
 QUALITY INDEX Q

PERCENT WITHIN TOLERANCE	-----									
	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358	0.2348	0.2339
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2083	0.2084	0.2076
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829	0.1821	0.1814
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566	0.1559	0.1553
55	0.1806	0.1500	0.1406	0.1353	0.1338	0.1322	0.1312	0.1304	0.1298	0.1293
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1048	0.1042	0.1038	0.1034
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792	0.0786	0.0781	0.0778	0.0775
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521	0.0518	0.0516
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260	0.0259	0.0258
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260	-0.0259	-0.0258
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521	-0.0518	-0.0516
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0792	-0.0786	-0.0781	-0.0778	-0.0775
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1048	-0.1042	-0.1038	-0.1034
45	-0.1806	-0.1500	-0.1406	-0.1353	-0.1338	-0.1322	-0.1312	-0.1304	-0.1298	-0.1293
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566	-0.1559	-0.1553
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829	-0.1821	-0.1814
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2083	-0.2084	-0.2076
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358	-0.2348	-0.2339
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624	-0.2613	-0.2604
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892	-0.2880	-0.2870
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161	-0.3148	-0.3137
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432	-0.3418	-0.3407
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705	-0.3690	-0.3678
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980	-0.3964	-0.3951
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4354	-0.4310	-0.4280	-0.4257	-0.4241	-0.4227
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537	-0.4520	-0.4506
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820	-0.4802	-0.4787
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105	-0.5087	-0.5072
30	-0.6787	-0.6000	-0.5719	-0.5583	-0.5504	-0.5454	-0.5419	-0.5394	-0.5375	-0.5360
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686	-0.5667	-0.5651
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982	-0.5962	-0.5947
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282	-0.6262	-0.6217
26	-0.7904	-0.7200	-0.6920	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587	-0.6567	-0.6551
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896	-0.6876	-0.6861
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211	-0.7192	-0.7177
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531	-0.7513	-0.7498
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858	-0.7840	-0.7826
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8246	-0.8214	-0.8192	-0.8174	-0.8161
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533	-0.8517	-0.8565

CHECK SHEET #24

TABLE 4 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX Q

PERCENT WITHIN TOLERANCE	-----									
	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882	-0.8868	-0.8057
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241	-0.9228	-0.9219
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610	-0.9599	-0.9591
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990	-0.9982	-0.9976
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382	-1.0377	-1.0374
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789	-1.0788	-1.0787
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212	-1.1215	-1.1217
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653	-1.1661	-1.1668
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115	-1.2129	-1.2141
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602	-1.2623	-1.2640
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118	-1.3148	-1.3172
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670	-1.3709	-1.3741
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265	-1.4316	-1.4358
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4716	-1.4829	-1.4914	-1.4981	-1.5035
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635	-1.5721	-1.5790
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5872	-1.6127	-1.6313	-1.6454	-1.6566	-1.6655
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6992	-1.7235	-1.7420	-1.7566	-1.7684
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8054	-1.8379	-1.8630	-1.8828	-1.8989
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362	-2.0657	-2.0897

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR 501003 PORTLAND CEMENT CONCRETE PAVEMENT – METHOD III
(Over 15,000 cubic yards)

Effective: January 1, 2003

This Special Provision Modifies Item 501 Portland Cement Concrete Pavement of the Standard Specifications.

501-1.1 Delete the first paragraph and replace with the following:

"This work shall consist of pavement composed of Portland Cement concrete, or pavement composed of Portland Cement concrete with partial replacement of cement with fly ash only, or with partial replacement of cement with Ground Granulated Blast-furnace (GGBF) slag only, with or without reinforcement, constructed on a prepared subgrade, subbase, or base course in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross sections on the plans.

501-2.1 FINE AGGREGATE

Delete the first sentence and replace with the following:

"Fine aggregate shall be defined as follows:

Sand. Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles and shall meet the following quality requirements:"

QUALITY TEST(IDOT A Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	10
Minus No. 200 Sieve Mat'l ASTM C 136 Max. %	3

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	1.0
Coal, Lignite & Shells %	1.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>3.0</i>

501-2.2 COARSE AGGREGATE

Delete this Section and replace with the following:

"Coarse aggregate shall be a non "D" cracking crushed stone as determined by the Department of Transportation.

Crushed stone. Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

The coarse aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT A Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	45
Minus No. 200 Sieve Mat'l ASTM C 136 Max. %	1 1/2

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	1.0
Clay Lumps %	0.25
Coal, Lignite & Shells %	0.25
Conglomerate %	4.0
Other Deleterious %	4.0 2/
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

1/ NOTE: If the material finer than the No. 200 sieve consists of dust from the fracture, essentially free from clay or silt, this percentage may be increased to 2.5%.

2/ NOTE: Includes deleterious chert. Deleterious chert shall be the lightweight fraction separated in a 2.55 heavy media separation.

Delete Table 2 and use the following gradations:

Sieve	¾" – No. 4	1" – No. 4
2	--	--
1 ½	--	100
1	100	90-100
¾	84-100	--
½	30-60	30-60
No. 4	0-12	0-10
No. 16	--	--
IDOT Gradation	(CA-11)	(CA-07)

501-2.3 CEMENT

Delete this section and replace with the following:

"501-2.3 Cementitious Material

- (a) Cement. Type I cement conforming to the requirements of ASTM C 150 shall be required.
- (b) Fly Ash. The fly ash shall meet the requirements of ASTM C 618, for Class C fly ash. The fly ash source shall be approved by the Department of Transportation, and the conditions outlined by Policy Memorandum No. 88-1, Quality Control Requirements For Fly Ash For Use In Portland Cement Concrete, effective January 1, 1988, or latest edition as issued by IDOT Bureau of Materials and Physical Research. Fly ash shall not be used in concrete mixtures after October 15 nor before April 1 unless the contractor demonstrates, by preparing a Test Batch, a 14 day strength no less than that obtained from the equivalent cement-only mix. The test batch for both the fly ash and cement-only mix shall be prepared in accordance with 501-3.6(A) or 501-3.6(B) and shall be constructed at no additional expense to the contract.
- (c) Ground Granulated Blast-furnace Slag.

The Ground Granulated Blast-furnace Slag (GGBF) shall consist of the glassy granular material formed when molten blast-furnace slag is rapidly chilled, and then finely ground. Type 1S portland blast-furnace slag cement or Type 1 (SM) slag-modified portland cement may be used at the option of the contractor provided the slag constituent does not exceed 25% of the mass (weight) of the portland blast-furnace slag cement. Portland blast-furnace slag cements shall not be used after October 15th nor before April 1st. The GGBF slag shall meet the standard physical and chemical requirements of AASHTO M-302, for grade 100 or grade 120 material. The GGBF slag shall meet the requirements of the Department's latest Policy Memorandum, "Acceptance Procedure of Finely Divided Minerals Used in Portland Cement Concrete and Other Applications." The GGBF slag must come from one of the approved suppliers on the Department's latest Annual List of Approved Suppliers of GGBF slag for P.C. Concrete. A Job Mix Formula (JMF) with portland cement, flyash, and GGBF slag will not be allowed for use on the project unless approved by the Engineer. GGBF slag shall not be used in concrete mixtures when the air temperature is below 40 °F. Different sources or grades of GGBF slag shall not be mixed or used alternately in the same item of construction.

501-2.7 DOWEL AND TIE BARS

Replace the second paragraph with the following:

Dowel bars shall be plain, round steel bars conforming to the requirements of AASHTO M227 Grades 70 through 80. The finished bars shall be saw cut and free from burrs or out-of-round ends which will prevent their slipping

CHECK SHEET #25

easily in the concrete. The bars shall be epoxy coated according to the requirements of AASHTO M254.

501-2.10 ADMIXTURES

Delete "(a) Pozzolanic Admixtures", "(b) Air-Entraining Admixtures", "(c) Water-Reducing Admixtures" and add the following to the first paragraph:

"Air-Entraining Admixture Water-Reducing Admixtures shall be required. Retarding admixtures may be used when approved by the Engineer. High Range Water Reducer may be required to achieve the workability needed by the contractor. The use of High Range Water Reducer shall be at no extra expense to the contract. All admixtures shall be approved by the Engineer."

(a) Air Entraining Admixtures

"Air-entraining admixtures approved by the Department of Transportation shall be used."

(b) Water-reducing Admixtures

"Water-reducing admixtures approved by the Department of Transportation shall be used."

(c) Retarding Admixtures

"Retarding admixtures approved by the Department of Transportation shall be used."

(d) High Range Water-Reducing Admixtures

"High range Water-reducing admixtures approved by the Department of Transportation shall be used."

501-2.11 CHEMICAL ADHESIVES

When it is necessary to anchor dowel and/or tie bars to hardened concrete, a chemical adhesive shall be used. The chemical adhesive resin system shall consist of a 2-part, fast setting resin and filler/hardener, and must be on the Illinois Department of Transportation's most recent Approved Chemical Adhesives List. (The latest list is available through the Materials Section of the Division of Aeronautics.). The adhesive shall be mixed in accordance with the manufacturer's instructions. After drilling, the hole shall be blown out with compressed air to remove any dust. The hole shall also be dry before installing dowel or tie bars. The adhesive shall be injected into the hole in a manner that fills from the back of the hole to approximately one third of its depth. When the bar is inserted, the quantity of adhesive shall be such that a small amount leaks out of the front of the hole. The Division of Aeronautics retains the right to test the chemical adhesive and the method of installation as a condition of approval.

501-3.1 EQUIPMENT

Add the following to the first paragraph:

"An onsite central mix plant shall be required and the concrete plant(s) shall conform to the following requirements or the Engineer may accept the use of a concrete plant approved by the IDOT Division of Highways, in accordance with Section 1103 of the Standard Specifications for Road and Bridge Construction. The onsite central mix concrete plant shall be used exclusively for this project during any and all paving operations."

Add the following as a second paragraph under (a) Batching Plant and Equipment, (1) General:

"The Batching Plant shall be a computerized plant interfaced with a printer and shall print actual batch weights, added water, tempering water, mixing time, and amount of each additive per batch.

Add the following as a second paragraph under (a) Batching Plant and Equipment, (2) Bins and Hopper:

"Cement and fly ash shall be stored in separate bins. When a manual plant is utilized, cement and fly ash shall be weighed in a separate weigh hopper. When an automatic batching plant is utilized, the fly ash may be weighed into the cement weigh hopper."

501-3.5 HANDLING, MEASURING, AND BATCHING MATERIAL

Add the following to the first paragraph:

"Loading out from stockpiles for purposes of batching, shall be accomplished in a systematic manner to minimize highly variable moisture contents. After concrete production begins, the contractor shall load out of an established stockpile while the others are constructed."

Add the following to the sixth paragraph:

"The air entrainment and water reducing admixtures shall be incorporated into the batch water stream during the batching process. Each additive must be added separately to the mixing water, with no mixing of additives."

501-3.6(A) PROPORTIONS

Delete the first paragraph and replace with the following:

"Proportioning requirements for the concrete shall be designed for a field compressive strength of 4000 psi at 28 days for pavements designed for aircraft weighing less than 60,000 pounds. The Contractor shall note that to ensure that not more than 10 percent of the concrete actually produced will fall below the specified strength, the mix design average strength must be higher than the specified strength. The concrete strength necessary to meet specification requirements depends on the producer's standard deviation of compressive test results and the accuracy which that value can be estimated from historic data for the same or similar materials."

CHECK SHEET #25

Delete the second paragraph and replace with the following:

"Prior to the start of paving operations and after approval of all materials to be used in the manufacture of the concrete, the Engineer will provide the mix design based on the IDOT computer generated mix design system. The contractor may submit his own mix design with substantiating test data subject to approval by the Engineer. The mix design shall produce a compressive strength of at least 800 psi over the specified field strength. Test specimens shall be required to verify mix design parameters. Compressive strength shall be as specified at 28 days using test specimens prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 39.

The contractor shall be required to provide all Quality Control personnel for the manufacture of the concrete. Quality Control shall be performed in accordance with the Division of Aeronautics' Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture. The use of a microwave moisture probe or equal for purposes of determining the percent moisture in the fine aggregate shall be required. The microwave moisture probe must be interfaced with the plant batching computer. The percent of free moisture (Above Saturated Surface Dry Moisture) and the adjusted fine aggregate batch weight must be determined by the microwave moisture probe and indicated on the computer screen for each batch. As part of the approval process, the contractor shall obtain a minimum of 10 samples of fine aggregate within the proximity at which the probe is fixed below the fine aggregate bin. The contractor shall determine the percent moisture (Above Saturated Surface Dry Moisture) by the Adjusted Oven Dry Method, the Chapman Flask, or the Dunagan Method for each sample. A correlation shall then be established between the contractor's results and the corresponding percent moisture indicated by the microwave moisture probe for each sample taken. If necessary, adjustments to the microwave probe should be made so that the correct percent moisture is utilized during the batching process. The calibration procedure described herein shall be completed in the presence of and witnessed by the Resident Engineer.

Delete the fifth paragraph and replace with the following:

"The cement content shall not be less than 6.5 sacks (611 lbs.) per cubic yard. When Class C fly ash is used, the amount of cement replaced shall not exceed 20 percent by mass (weight) or 122 pounds, at a replacement ratio of 1.25 to 1 (fly ash: cement replaced). Fly ash and cement weights will be rounded up to the nearest 5 lbs. in the mix design. For cement-fly ash mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag : cement replaced) shall be a 1 to 1 replacement for Grade 100 or grade 120. For cement-GGBF slag mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. Measurements of GGBF slag and cement shall be rounded up to the nearest 5 lbs. In the mix design.

Add the following three paragraphs after the last paragraph of this Section.

"Test Batch. At least 28 days prior to the start of production the contractor and/or producer shall prepare a Test Batch under the direction of the Engineer. The Test Batch shall be prepared at the concrete plant proposed for use in the

production of the concrete mix for the project and shall be in accordance with the approved Job Mix Formula (JMF). When approved by the Engineer, the Test Batch may be prepared at a different plant provided that the same materials specified in the JMF are used. In addition, the proposed Test Batch plant must meet the plant requirements specified herein. If more than one (JMF) is required as a result of different sources of materials, additional test batches shall be conducted for each (JMF) as outlined herein. The cost for each additional test batch shall be borne by the contractor. The plant shall have been surveyed and approved by the Engineer prior to preparation of the Test Batch. As required by these Special Provisions the contractor shall provide all Quality Control for production of the concrete. The contractor shall have his Quality Control Officer and a representative of the contractor familiar with the paving operation, present at the test batch preparation. The Test Batch shall be prepared as follows:

1. Proportioning. Prior to preparation of the mix, the Proportioning Technician shall perform a minimum of two (2) gradation analysis and two (2) moisture tests on each aggregate used. From this data, the JMF shall be adjusted for moisture, as outlined in IDOT's Manual of Instructions for Concrete Proportioning and Testing.
2. Preparation of the Mix:
 - A) Prepare a Test Batch that is at least one-half (1/2) the manufacturer's rated capacity of the mixing drum (in cubic yards). The Test Batch shall be prepared in accordance with the approved JMF, adjusted for moisture.
 - B) Mixing requirements shall be:
 - a) Minimum of 90 seconds. If transit mixer trucks are used to transport the mix, the mix shall be agitated, after mixing, at 2-5 RPM for the approximate travel time anticipated between batching at the plant and deposit of the concrete in the forms.

If non-mixing trucks are used to transport the mix, the mix shall remain in the central mixer with no mixing or agitation for the approximate time anticipated from when mixing is complete and deposit of the concrete in the forms.
 - C) Air, Slump, and Water/Cement Ratio (w/c): After aging, the air content of the concrete shall be 6.0% plus or minus 1.5%. The slump and water/cement ratio shall not exceed the following criteria as outlined by Table 1 below:

TABLE 1: 4000 PSI CONCRETE

<u>CONCRETE TEMPERATURE</u>	<u>CEMENT MIX</u>		<u>CEMENT FLYASH MIX</u>		<u>IDOT RECOMMENDED DOSAGE of WATER REDUCER</u>
	<u>MAX W/C</u>	<u>MAX SLUMP</u>	<u>MAX W/C</u>	<u>MAX SLUMP</u>	
50-60°F	0.44	4 IN.	0.40	4 IN.	1 TIMES
61-70°F	0.44	4 IN.	0.40	4 IN.	1 TIMES
71-80°F	0.44	3 IN.	0.41	3 IN.	1 TIMES
81-90°F*	0.44	2 IN.	0.42	2 IN.	*1 TIMES
91-95°F	0.44	1.5 IN.	0.42	1.5 IN.	1.5 TIMES

* At 85°F and above, the dosage of water reducer shall be 1.5 times the recommended dosage. Concrete produced at these temperatures may require the use of Mid Range Water Reducers and/or Retarding admixtures. If shrinkage cracks should develop at any time, the paving operation shall cease until the condition is corrected by the contractor. This may require the use of additional admixtures and/or the use of a fog sprayer system on the finishing equipment.

NOTE: The actual water/cement ratio established at the time of the Test Batch shall be the maximum permitted for production concrete. The maximum slump shall be established from TABLE 1 using the actual temperature of the concrete at the time of production. This slump may be exceeded to a maximum limit of 4 inches when approved by the Engineer and by the use of superplasticizer only.

Once the concrete conforms to TABLE 1, cylinders shall be made for testing at 3,7,14, and 28 days. With permission from the Engineer at the time of the Test Batch, the maximum slump may be exceeded provided the maximum allowable water-cementitious ratio is not exceeded. In addition, the contractor should be aware that if the Test Batch concrete does not obtain 4800 PSI at 28 days, a new Test Batch shall be required at the contractor's expense.

- D) The Proportioning Technician shall complete Form AER M-7, Plastic Concrete Air, Slump and Quantity and Form AER M-6, Concrete Moisture Determination (Adjusted Oven Dry Method), to be given to the Resident Engineer after completion of the Test Batch.
- E) The Resident Engineer shall complete Form AER M-4, Concrete Plant Production, Mix Verification.
- F) The concrete test cylinders shall be tested at 3, 7, 14, and 28 days to establish a growth curve of concrete strength vs. age. The compressive strength shall be at least 800 psi, over the specified strength, at 28 days.

The Test Batch shall be paid for under Section 501-5.20. Only one Test Batch will be paid for per project. Any additional Test Batches shall be paid for by the contractor.

The contractor shall provide complete facilities for the curing of the cylinders on the job site. Curing facilities for test cylinders shall include, but not be limited to, furnishing and operating water tanks equipped with temperature control devices that will automatically maintain the temperature of the water as specified in ASTM C 31. Submersible heaters are acceptable provided the above mentioned criteria are achieved.

501-3.6 (B) PROPORTIONS

Delete the first paragraph and replace with the following:

"Proportioning requirements for concrete shall be designed for a field flexural strength of 650 psi at 28 days for pavements designed for aircraft weighing 60,000 pounds or more. The Contractor shall note that to ensure that not more than 10 percent of the concrete actually produced will fall below the specified strength, the mix design average strength must be higher than the specified strength. The concrete strength necessary to meet specification requirements depends on the producer's standard deviation of flexural test results and the accuracy which that value can be estimated from historic data for the same or similar materials."

Delete the second paragraph and replace with the following:

"Prior to the start of paving operations and after approval of all materials to be used in the manufacture of the concrete, the Engineer will provide the mix design based on the IDOT computer generated mix design system. The contractor may submit his own mix design with substantiating test data subject to approval by the Engineer. The mix design shall produce a flexural strength of at least 100 psi over the specified field strength. Test specimens shall be required to verify mix design parameters. Flexural strength shall be as specified at 28 days using test specimens prepared in accordance with ASTM C 31 and tested in accordance with ASTM C 78. For side form concrete, superplasticizer shall be required.

The contractor shall be required to provide all Quality Control personnel for the manufacture of the concrete. Quality Control shall be performed in accordance with the Division of Aeronautics' Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of PCC Pavement Mixture. The use of a microwave moisture probe or equal for purposes of determining the percent moisture in the fine aggregate shall be required. The microwave moisture probe must be interfaced with the plant batching computer. The percent of free moisture (Above Saturated Surface Dry Moisture) and the adjusted fine aggregate batch weight must be determined by the microwave moisture probe and indicated on the computer screen for each batch. As part of the approval process, the contractor shall obtain a minimum of 10 samples of fine aggregate within the proximity at which the probe is fixed below the fine aggregate bin. The contractor shall determine the percent moisture (Above Saturated Surface Dry Moisture) by the Adjusted Oven Dry Method, the Chapman Flask, or the Dunagan Method for each sample. A

CHECK SHEET #25

correlation shall then be established between the contractor's results and the corresponding percent moisture indicated by the microwave moisture probe for each sample taken. If necessary, adjustments to the microwave probe should be made so that the correct percent moisture is utilized during the batching process. The calibration procedure described herein shall be completed in the presence of, and witnessed by the Resident Engineer.

Delete the fifth paragraph and replace with the following:

"The cement content shall not be less than 6.5 sacks (611 lbs.) per cubic yard. When Class C fly ash is used, the amount of cement replaced shall not exceed 20% by mass (weight) or 122 pounds, at a replacement ratio of 1.25 to 1 (fly ash: cement replaced). Fly ash and cement weights will be rounded up to the nearest 5 lbs. in the mix design. For cement-fly ash mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. The amount of cement replaced by GGBF slag shall not exceed 25 percent by mass (weight). The replacement ratio (GGBF slag : cement replaced) shall be a 1 to 1 replacement for Grade 100 or grade 120. For cement-GGBF slag mixes, the water/cement ratio will be based on the total cementitious material contained in the mix. Measurements of GGBF slag and cement shall be rounded up to the nearest 5 lbs. In the mix design."

Add the following paragraph after the last paragraph of this Section.

"Test Batch. At least 28 days prior to the start of production the contractor and/or producer shall prepare a Test Batch under the direction of the Resident Engineer. The Test Batch shall be prepared at the concrete plant proposed for use in the production of the concrete mix for the project and shall be in accordance with the approved Job Mix Formula (JMF). When approved by the Engineer, the Test Batch may be prepared at a different plant provided that the same materials specified in the JMF are used. In addition, the proposed Test Batch plant must meet the plant requirements specified herein. If more than one (JMF) is required as a result of different sources of materials, additional test batches shall be conducted for each (JMF) as outlined herein. The cost for each additional test batch shall be borne by the contractor. The plant shall have been surveyed and approved by the Engineer prior to preparation of the Test Batch. As required by these Special Provisions the contractor shall provide all Quality Control for production of the concrete. The contractor shall have his Quality Control Officer and a representative of the contractor familiar with the paving operation, present at the test batch preparation. The Test Batch shall be prepared as follows:

1. Proportioning. Prior to preparation of the mix, the Proportioning Technician shall perform a minimum of two (2) gradation analysis and two (2) moisture tests on each aggregate used. From this data, the JMF shall be adjusted for moisture, as outlined in IDOT's Manual of Instructions for Concrete Proportioning and Testing.
2. Preparation of the Mix:
 - A) Prepare a Test Batch that is at least one-half (1/2) the manufacturer's rated capacity of the mixing drum (in cubic yards). The Test Batch shall

be prepared in accordance with the approved JMF, adjusted for moisture.

B) Mixing requirements shall be:

a) Minimum of 90 seconds. If transit mixer trucks are used to transport the mix, the mix shall be agitated, after mixing, at 2-5 RPM for the approximate travel time anticipated between batching at the plant and deposit of the concrete in the forms.

If non-mixing trucks are used to transport the mix, the mix shall remain in the central mixer with no mixing or agitation for the approximate time anticipated from when mixing is complete and deposit of the concrete in the forms.

C) Air, Slump, and Water/Cement Ratio (w/c): After aging, the air content of the concrete shall be 6.0% plus or minus 1.5%. The slump and water/cement ratio shall not exceed the following criteria as outlined by Table 1 below:

TABLE 1: 4000 PSI CONCRETE

<u>CONCRETE TEMPERATURE</u>	<u>CEMENT MIX</u>		<u>CEMENT FLYASH MIX</u>		<u>IDOT RECOMMENDED DOSAGE of WATER REDUCER</u>
	<u>MAX W/C</u>	<u>MAX SLUMP</u>	<u>MAX W/C</u>	<u>MAX SLUMP</u>	
50-60°F	0.42	3 IN.	0.37	3 IN.	1 TIMES
61-70°F	0.42	2 IN.	0.37	2 IN.	1 TIMES
71-80°F	0.42	1.5 IN.	0.38	1.5 IN.	1 TIMES
81-90°F*	0.42	1 IN.	0.39	1.25 IN.	*1 TIMES
91-95°F	0.42	7/8 IN.	0.39	1 IN.	1.5 TIMES

* At 85°F and above, the dosage of water reducer shall be 1.5 times the recommended dosage. Concrete produced at these temperatures may require the use of Mid Range Water Reducers and/or Retarding admixtures. If shrinkage cracks should develop at any time, the paving operation shall cease until the condition is corrected by the contractor. This may require the use of additional admixtures and/or the use of a fog sprayer system on the finishing equipment.

NOTE: The actual water/cement ratio established at the time of the Test Batch shall be the maximum permitted for production concrete. The maximum slump shall be established from TABLE 1 using the actual temperature of the concrete at the time of production. This slump may be exceeded to a maximum limit of 4 inches when approved by the Engineer and by the use of superplasticizer only.

CHECK SHEET #25

Once the concrete conforms to TABLE 1, cylinders shall be made for testing at 3,7,14, and 28 days. With permission from the Engineer at the time of the Test Batch, the maximum slump may be exceeded provided the maximum allowable water-cementitious ratio is not exceeded. In addition, the contractor should be aware that if the Test Batch concrete does not obtain 4800 PSI at 28 days, a new Test Batch shall be required at the contractor's expense.

- D) The Proportioning Technician shall complete Form AER M-7, Plastic Concrete Air, Slump and Quantity and Form AER M-6, Concrete Moisture Determination (Adjusted Oven Dry Method), to be given to the Resident Engineer after completion of the Test Batch.
- E) The Resident Engineer shall complete Form AER M-4, Concrete Plant Production, Mix Verification.
- F) The concrete test cylinders shall be tested at 3, 7, 14, and 28 days to establish a growth curve of concrete strength vs. age. The compressive strength shall be at least 800 psi, over the specified strength, at 28 days.

The Test Batch shall be paid for under Section 501-5.20. Only one Test Batch will be paid for per project. Any additional Test Batches shall be paid for by the contractor.

The contractor shall provide complete facilities for the curing of the cylinders on the job site. Curing facilities for test cylinders shall include, but not be limited to, furnishing and operating water tanks equipped with temperature control devices that will automatically maintain the temperature of the water as specified in ASTM C 31. Submersible heaters are acceptable provided the above mentioned criteria are achieved.

501-3.7 FIELD TEST SPECIMENS

Delete the first and second paragraphs and replace with the following:

"Concrete samples shall be taken in the field by the Contractor's Quality Control Personnel to determine consistency (slump), air content, and strength of the concrete. A minimum of one random flexural strength sample or one random compressive strength sample shall be taken for every 300 cubic yards for acceptance testing. A sample shall consist of two (2) beam breaks for flexural strength testing or two (2) cylinders for compression strength testing. Additional beams or cylinders shall be taken for testing at 3, 7, and 14 days until such time as the Engineer is satisfied that the concrete production, sampling, and testing is under control. All samples shall be prepared in accordance with ASTM C 31 and tested in accordance with either ASTM C 39 or ASTM C 78. For flexural strength testing under ASTM C 78, three (3) Rainhart Series 416, Recording Beam Tester or equivalent, shall be required. The 3, 7 and 14 day test results will be used to monitor strength growth and quality control.

501-3.8 MIXING CONCRETE

Delete the first sentence of the second paragraph and replace with the following:

The mixing time shall be 90 seconds. However, the contractor may at his own expense elect to perform a mixer performance test in accordance with Illinois Division of Aeronautics' Policy Memorandum 95-1, Field Test Procedures for Mixer Performance and Concrete Uniformity Tests. The test shall be conducted after issuance of the notice to proceed and in the presence of the Engineer. A maximum of two mixing times shall be considered by the Division.

Add the following as the third sentence of the fourth paragraph:

When a retarding admixture is approved and being used as part of the approved Job Mix Formula, the time elapsing from the time the water is added to the mix until the concrete is deposited in place at the work site shall not exceed 60 minutes when the concrete is hauled in nonagitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators.

501-3.9 LIMITATIONS OF MIXING

Add the following to the fifth paragraph:

When the temperature of the plastic concrete reaches 85°F, the contractor shall make adjustments to maintain the required slump. In no case shall the addition of water raise the water/cementitious ratio above the approved JMF water/cementitious ratio. The contractor may have to utilize water reducing and/or retarding admixtures to control slump and initial set. The dosage rate of chemicals shall be determined by the contractor and approved by the Engineer. When the temperature of the plastic concrete reaches 90°F, an approved retarding admixture shall be used. Plastic concrete temperatures up to 96°F, as placed may be permitted, only when approved by the Division of Aeronautics' Engineer of Materials, provided onsite conditions permit placement and finishing without excessive use of water and/or overworking the surface. The occurrence within 24 hours of unusual surface distress shall be cause to revert to a maximum 90°F plastic concrete temperature. Any concrete which in the opinion of the Engineer has a significant amount of surface distress shall be removed and replaced at no extra expense to the contract. Repair of any damaged concrete will be allowed only when approved by the Engineer.

501-3.15 SKID RESISTANT SURFACES

Delete this section.

501-3.16 CURING

(e) Curing in cold weather

Delete this section and replace with the following:

CHECK SHEET #25

Whenever the ambient air temperature for day or night concreting operations is below 40 °F, the contractor shall submit a cold weather concreting plan. The plan shall comply with the Illinois Department of Transportation, Division of Aeronautics, Policy Memorandum 2001-1, REQUIREMENTS FOR COLD WEATHER CONCRETING. Cold weather concrete operations shall not proceed until the Engineer has approved the contractor's cold weather concreting plan.

501-3.26 QUALITY CONTROL PLAN

The Contractor shall be required to provide all Quality Control personnel for the manufacture of all the concrete. Quality Control shall be performed in accordance with IDOA's Policy Memorandum No. 87-3, Mix Design, Test Batch, Quality Control, and Acceptance Testing of P.C.C. Pavement Mixture. All quality control forms and mix verification forms shall be completed for each day's concrete production by the contractor's quality control technician.

A Quality Control Plan acceptable to the Engineer shall be provided by the Contractor in accordance with Section 501-3.26. The Contractor shall designate a Quality Control Officer to supervise the manufacture, handling, curing, and reporting of all quality control beams, cylinders and other test specimens.

The Contractor's quality control activities shall include the following:

The Contractor shall submit his quality control plan to the Engineer for approval prior to the start of production. The quality control plan shall include as a minimum:

1. The assignment of quality control responsibility to specifically named individual(s).
2. Performance of regularly scheduled inspection procedures and the manufacture, handling and curing of all test specimens.
3. Provisions for the prompt implementation of control and corrective measures.
4. Provisions for liaison with the Engineer at all times.
5. Performance of necessary quality control tests in accordance with the Quality Control Testing.

Quality Control Testing. The Contractor's quality control testing program shall include, but not necessarily be limited to, tests for the moisture content and gradations and preparation of field test specimens. The Contractor shall maintain control charts which show action and suspension limits. These charts shall be accessible to the Engineer at all times. A random sampling procedure as directed by the Engineer shall be used for obtaining test samples.

1. Gradation. The Contractor shall test the aggregate gradation, and maintain control charts on key sieves. A minimum of two (2) gradation analysis shall be performed on each aggregate, each day.
2. Moisture. The Contractor shall determine the moisture content of each aggregate for use in adjusting the added water during the production of the P.C. Concrete. A minimum of two (2) moisture tests shall be performed on each aggregate used daily.
3. Mix Verification. The Contractor shall record the proportions of all materials being used in a batch of P.C. concrete. A minimum of two (2) visual observations and recording of the proportions shall be made each day.
4. Strength Correlation. It is recommended that the Contractor establish a correlation between the 28 day strength and a 7 day strength. This will give an indication of the 28 day strength at 7 days.
5. Test Specimen Preparation. The Contractor shall prepare field test specimens by providing all labor and equipment for the following. All work shall be under the guidance of an individual with previous experience in preparation of concrete test specimens.
 - I. Supply all equipment and labor required to prepare and transport field specimens, including wheel barrows, vibrators and trucks.
 - a) Prepare the field test specimens in accordance with ASTM C-31 and mark them for documentation.
 - II. Place and maintain wet burlap (or specimen covers approved by the Resident Engineer) over the specimens in the field until the specimens are transported to the field laboratory.
 - III. Transport the specimens to the storage and curing location and unload the specimens.
 - IV. Strip the forms off the specimens, mark the specimens with an identification number and place in the curing tanks or steam room.
 - V. Remove specimens from curing tanks and deliver to Resident Engineer's representative at the concrete laboratory for testing and load specimen on beam tester.
 - VI. Supply all molds for specimens. If reusable molds are supplied, they shall be cleaned and oiled prior to reuse.
 - VII. Remove tested specimens from site after they are tested.
6. Test Machine. If acceptance is based on flexural strength, the Contractor shall provide Rainhart Series 416, recording beam tester or equal to be used by the Engineer to determine the strength of the field test specimens.

CHECK SHEET #25

Cost of furnishing test machines shall be included in the cost of the Concrete Test Laboratory. The initial calibration of equipment is part of the Quality Control and is incidental to the concrete pavement cost. The contractor shall provide facilities for the storage and operation of beam testing machines complete with artificial lighting.

Any additional testing that the Contractor deems necessary to control the process may be performed at the Contractor's option.

The Engineer will monitor any or all of the above testing. In addition, the Contractor shall coordinate the following responsibilities with the QAE (Quality Assurance Engineer) designated by the Resident Engineer.

- a) Adjust Proportions Based on Moisture Tests. Based on the daily moisture tests and mix verification information, the Contractor shall determine the water/cementitious ratio. The contractor shall adjust his mix proportions, either water, water reducer, or by the use of additional cement to produce a workable mix without exceeding the approved Job Mix Formula (JMF) water/cementitious ratio. Violation of the approved JMF water/cementitious ratio shall result in suspension of concrete production by the Engineer until the problem is resolved to the satisfaction of the Engineer.
- b) Quality Control Deficiencies. The Contractor shall take prompt action to correct any errors, equipment malfunction, process changes, or other assignable causes which have resulted or could result in submission of materials and completed construction which do not conform to the requirements of the specifications.
- c) Documentation. The Contractor shall document his quality control efforts. Test results shall be made available to the Engineer daily.

501-5.1 GENERAL.

Delete this section and replace with the following:

"The quantity of Portland Cement Concrete Pavement measured as outlined in Section 501-4.1 shall be adjusted in accordance with Section 501-5.3 Price Adjustment as specified herein. Payment shall be calculated by multiplying the contract unit price per square yard of completed pavement and the adjusted square yards per LOT. Final payment shall be full compensation for furnishing and placing all materials, including any dowels, steel reinforcement, joint materials, and texturing, except for saw-cut grooving. This also includes payment for all Quality Control Engineering.

The Test Batch shall be paid at the contract unit price per each, which price shall include all material, equipment, labor and engineering necessary to complete this section.

501-5.2

Payment will be made under:

- Item AR501505 -- 5" PCC Pavement -- per square yard.
- Item AR501506 -- 6" PCC Pavement -- per square yard.
- Item AR501507 -- 7" PCC Pavement -- per square yard.
- Item AR501508 -- 8" PCC Pavement -- per square yard.
- Item AR501509 -- 9" PCC Pavement -- per square yard.
- Item AR502510 -- 10" PCC Pavement -- per square yard.
- Item AR502511 -- 11" PCC Pavement -- per square yard.
- Item AR501512 -- 12" PCC Pavement -- per square yard.
- Item AR501513 -- 13" PCC Pavement -- per square yard.
- Item AR501514 -- 14" PCC Pavement -- per square yard.
- Item AR501515 -- 15" PCC Pavement -- per square yard.
- Item AR501516 -- 16" PCC Pavement -- per square yard.
- Item AR501517 -- 17" PCC Pavement -- per square yard.
- Item AR501518 -- 18" PCC Pavement -- per square yard.
- Item AR501519 -- 19" PCC Pavement -- per square yard.
- Item AR501520 -- 20" PCC Pavement -- per square yard.
- Item AR501530 -- PCC Test Batch -- per each.

501-5.3 PRICE ADJUSTMENT

Delete the word price in the first sentence of (A) Thickness Adjustment and Table 3 and replace with the word quantity.

Add the following to the first paragraph:

"The contractor shall cut one core per LOT to determine the adjustment for thickness. The location of the core shall be randomly determined by the Resident Engineer. All holes shall be filled by the contractor with a non shrink grout approved by the Engineer. All associated costs shall be borne by the contractor."

Delete (B) Flexural Strength Adjustment and (C) Compressive Strength Adjustment and replace with the following:

(B) Flexural or Compressive Strength Adjustment

Acceptance of the pavement shall be on a LOT basis using the flexural or compressive strengths obtained from test specimens prepared and tested in accordance with Section 501-3.7, Field Test Specimens, specified herein. There shall be no mixing of mix designs in the same lot.

1. LOT Size. A LOT shall consist of the average of four (4) SUBLOT samples, but shall not exceed six (6) SUBLOTS. The minimum number of sublots per lot shall be three (3).

- (a) A SUBLOT shall consist of the equivalent square yards of pavement required to place 300 cubic yards of concrete. All

samples used to determine acceptance of the pavement shall be tested at 28 days.

2. LOT Early Termination. When less than three (3) SUBLOTS are produced, such as the end of construction of the pavement or at the end of the construction season, the final SUBLOT tests shall be included with the previous LOT for payment. The final LOT may thus contain up to six (6) SUBLOTS.
3. Acceptance Criteria. The acceptance of each LOT of concrete pavement shall be based on the Percentage of concrete Within specification Limits (PWL). The PWL is determined using standard statistical techniques which involves the flexural or compressive strength acceptance tests from each LOT and the Quality Index. The Quality Index is calculated using one of the following formulae:

FLEXURAL TEST	COMPRESSIVE TEST
$Q = \frac{\bar{X} - 650PSI}{S}$	$Q = \frac{\bar{X} - 4000PSI}{S}$

Where Q = Quality Index

\bar{X} = Mean (average) of the SUBLOT flexural or compressive strength tests.

S = Standard Deviation of SUBLOT flexural or compressive strength tests.

The PWL is determined by entering Table 4 with the "Q" using the column for the appropriate number (N) of flexural or compressive strength LOT tests. Each LOT of concrete pavement shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When a LOT is below 90 percent, the LOT square yards shall be adjusted in accordance with Table 5.

TABLE 5 PAY ADJUSTMENT SCHEDULE (see note 2/)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	1.

- 1/ The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.
- 2/ All preliminary calculations used in determining the Percent Within Limits should be carried to a minimum of four (4) digits right of the

decimal point. The PWL that is determined from Table 4 should then be rounded to one significant figure past the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be to one significant figure past the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each LOT as soon as all LOT tests are completed. The pay calculations for each LOT are **final** and no pavement coring is allowed unless resampling has been approved by the Engineer.

- (d) Resampling and Retesting. The contractor may request resampling and retesting in accordance with the latest version of the Division of Aeronautics Policy Memorandum 90-1, Resampling and Retesting of PCC Pavement.

CHECK SHEET #25

TABLE 4
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX Q

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789	1.0788	1.0787
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382	1.0377	1.0374
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990	0.9982	0.9976
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643	0.9624	0.9610	0.9599	0.9591
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241	0.9228	0.9219
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882	0.8868	0.8857
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533	0.8517	0.8505
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192	0.8175	0.8161
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858	0.7840	0.7826
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531	0.7513	0.7498
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211	0.7192	0.7177
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896	0.6877	0.6861
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587	0.6567	0.6551
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282	0.6262	0.6247
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982	0.5962	0.5947
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686	0.5667	0.5651
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454	0.5419	0.5394	0.5375	0.5360
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105	0.5086	0.5072
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820	0.4802	0.4787
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537	0.4520	0.4506
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310	0.4280	0.4257	0.4241	0.4227
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031	0.4001	0.3980	0.3964	0.3951
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705	0.3690	0.3678
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432	0.3418	0.3407
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161	0.3148	0.3137
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892	0.2880	0.2870
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624	0.2613	0.2604

TABLE 4 (Continued)
 TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
 (STANDARD DEVIATION METHOD)
 QUALITY INDEX Q

PERCENT WITHIN TOLERANCE	-----									
	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358	0.2348	0.2339
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2083	0.2084	0.2076
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829	0.1821	0.1814
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566	0.1559	0.1553
55	0.1806	0.1500	0.1406	0.1353	0.1338	0.1322	0.1312	0.1304	0.1298	0.1293
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1048	0.1042	0.1038	0.1034
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792	0.0786	0.0781	0.0778	0.0775
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521	0.0518	0.0516
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260	0.0259	0.0258
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260	-0.0259	-0.0258
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521	-0.0518	-0.0516
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0792	-0.0786	-0.0781	-0.0778	-0.0775
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1048	-0.1042	-0.1038	-0.1034
45	-0.1806	-0.1500	-0.1406	-0.1353	-0.1338	-0.1322	-0.1312	-0.1304	-0.1298	-0.1293
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566	-0.1559	-0.1553
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829	-0.1821	-0.1814
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2083	-0.2084	-0.2076
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358	-0.2348	-0.2339
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624	-0.2613	-0.2604
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892	-0.2880	-0.2870
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161	-0.3148	-0.3137
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432	-0.3418	-0.3407
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705	-0.3690	-0.3678
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980	-0.3964	-0.3951
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4354	-0.4310	-0.4280	-0.4257	-0.4241	-0.4227
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537	-0.4520	-0.4506
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820	-0.4802	-0.4787
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105	-0.5087	-0.5072
30	-0.6787	-0.6000	-0.5719	-0.5583	-0.5504	-0.5454	-0.5419	-0.5394	-0.5375	-0.5360
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686	-0.5667	-0.5651
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982	-0.5962	-0.5947
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282	-0.6262	-0.6247
26	-0.7904	-0.7200	-0.6920	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587	-0.6567	-0.6551
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896	-0.6876	-0.6861
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211	-0.7192	-0.7177
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531	-0.7513	-0.7498
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858	-0.7840	-0.7826
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8246	-0.8214	-0.8192	-0.8174	-0.8161
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533	-0.8517	-0.8505

CHECK SHEET #25

TABLE 4 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX Q

PERCENT WITHIN TOLERANCE	-----									
	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882	-0.8868	-0.8057
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241	-0.9228	-0.9219
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610	-0.9599	-0.9591
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990	-0.9982	-0.9976
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382	-1.0377	-1.0374
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789	-1.0788	-1.0787
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212	-1.1215	-1.1217
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653	-1.1661	-1.1668
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115	-1.2129	-1.2141
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602	-1.2623	-1.2640
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118	-1.3148	-1.3172
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670	-1.3709	-1.3741
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265	-1.4316	-1.4358
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4716	-1.4829	-1.4914	-1.4981	-1.5035
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635	-1.5721	-1.5790
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5872	-1.6127	-1.6313	-1.6454	-1.6566	-1.6655
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6992	-1.7235	-1.7420	-1.7566	-1.7684
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8054	-1.8379	-1.8630	-1.8828	-1.8989
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362	-2.0657	-2.0897

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR501115 CRACK AND SEAT PAVEMENT

Effective: January 1, 2003

DESCRIPTION

1.1 This item shall consist of cracking and seating the existing variable depth PCC pavement prior to construction of the bituminous overlay.

This item shall also consist of cleaning all loose, spalled material from the surface of the pavement prior to paving.

EQUIPMENT

2.1 CRACKING HAMMER

The equipment used for cracking the designated pavements shall be capable of producing the desired cracking pattern as detailed in the plans. Should the equipment used not produce the desired cracking pattern, it shall be replaced. The Engineer shall have final approval of the equipment used and shall be able to reject the cracking equipment.

2.2 ROLLERS

Seating shall be accomplished with either a vibratory roller or a heavy pneumatic-tire roller.

The vibratory roller shall have a drum diameter of 48 inches, a drum length of 66 inches, vibrators with 1,600 VPM, a total applied force of 325 pounds per lineal inch; unit static force of 125 pounds per lineal inch, and adjustable eccentrics.

A heavy pneumatic-tired roller shall have a gross weight of not less than 25 tons and shall consist of not less than 4 pneumatic-tired wheels revolving in one transverse line. The width of the roller shall be not less than 8 feet, and it shall be constructed in two or more sections in such a manner that each section is free to oscillate or move independently. Under working conditions, the roller shall develop a compression of not less than 650 pounds per inch width of tire tread.

CONSTRUCTION METHODS

3.1 CRACKING

The existing concrete pavement, where shown on the plans or as directed by the Engineer, shall be broken in place to produce individual pavement elements approximately of the size detailed in the plans without dislodging the cracked pieces or causing surface spalling.

The cracking shall be performed only to the extent that will produce random fractures the full depth and width of the slab at the specified intervals, yet maintain aggregate interlock in the fractured faces, all to the satisfaction of the Engineer. Continued longitudinal cracks shall be prevented by varying the cracked method.

It is not the intent of this project to crush or shatter the existing concrete, but only to crack it as specified.

The Contractor shall furnish a water truck to wet down the concrete pavement to highlight the cracks in the pavement. The intent of this requirement is to prevent overfracturing the concrete pavement and to verify the specified crack pattern.

The pavement breaking hammer shall be operated on a test section designated by the Engineer. The hammer shall make a sufficient number of passes spaced equally across the pavement to produce the desired cracking pattern. The forward speed, number of flows of the hammer, and level of impact energy shall be adjusted on this test section to produce the specified cracking pattern.

3.2 SEATING

Seating of the cracked pavement shall be accomplished by a minimum of five passes of the roller or until no additional vertical drop in the pavement is discernible by the Engineer. A single pass shall consist of the coverage of a fixed point twice, once up and back.

3.3 PAVEMENT CLEANING

Following the cracking and seating operation, the pavement surface shall be cleaned of all spalled and/or loose concrete by means of a power broom and compressed air equipment. It is the intent of this specification to thoroughly clean the pavement prior to the installation of the tack coat. Any localized holes or voids shall be tacked and filled with aggregate-bituminous or sand-bituminous material as directed by the Resident Engineer.

METHOD OF MEASUREMENT

- 4.1 The quantity of pavement cracking and seating to be paid for shall be the number of square yards of area cracked, seated and cleaned as specified, completed and accepted.

BASIS OF PAYMENT

- 5.1 The accepted quantity of pavement cracking and seating shall be paid for at the contract unit price per square yard which price and payment shall be full compensation for furnishing all equipment and materials, and for all preparation, modification of equipment as needed, cleaning watering and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item AR501115 -- Crack & Seat Pavement -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR501540 PCC PAVEMENT GROOVING

Effective: January 1, 2003

DESCRIPTION

1.1 GENERAL

This item shall consist of constructing a skid resistant surface by providing sawcut grooves in the new portland cement concrete surface.

EQUIPMENT

2.1 GROOVING EQUIPMENT

The equipment used for grooving shall be power saw cutting equipment, equipped with diamond blades mounted on a multi-blade arbor spaced to groove the runway to the dimensions specified herein, and as shown on the plans.

A cutting head width capable of grooving the runway to the specified tolerances shall be maintained.

The grooving equipment shall be equipped with automatic groove depth control which shall automatically adjust the cutting head and maintain groove depth within the specified tolerances. Sensors for depth control shall be located immediately adjacent to the axis of the cutting head.

The grooving equipment shall be equipped to meet the requirements of this item.

The Contractor shall submit a complete list of grooving equipment to be used on the job for approval by the Engineer before start of the work.

CONSTRUCTION METHODS

3.1 CURE TIME

The new P.C.C. shall have reached the strength specified in Item 501 prior to initiation of grooving operations unless otherwise authorized by the Engineer.

Grooving operations shall be initiated after the specified cure period.

3.2 GROOVE DIMENSIONS

Grooves shall be saw-cut in the pavement to the dimensions detailed in the plans.

The grooves shall be continuous for the entire runway length.

Grooves shall be cut at 90° to the runway centerline to within 10 feet of the runway pavement edge but not exceeding 130 feet.

Saw-cut grooves may not be closer than 3 inches to transverse paving joints.

Grooves may be continued through longitudinal construction joints.

Alignment shall not vary by plus or minus 1-1/2" for 75 feet.

Groove tolerances shall be:

Minimum depth = 3/16 inch.

Maximum depth = 5/16 inch.

Minimum width = 3/16 inch.

Maximum width = 5/16 inch.

Center to center spacing tolerances shall be:

Minimum spacing = 1 ¼ inches.

Maximum spacing = 2 inches.

3.3 TEST SECTION

Before initiating grooving operations on the runway, the Contractor shall demonstrate the performance of his operations and machines on a section of pavement designated by the Resident Engineer of similar construction to the runway. The Contractor shall have on hand each machine and each operator he proposes to use for runway grooving, and each combination groove a test section approximately 30 feet in width and 60 feet in length. The requirements of these specifications must be met before beginning of grooving of the runway. No payment will be made for this test strip.

3.4 REMOVAL OF SLURRY

The removal of slurry shall be continuous throughout the grooving operations. The grooving equipment shall be equipped with vacuum slurry pick-up equipment which shall continuously pick up water and sawing dust, and pump the slurry to a collection tank.

CHECK SHEET #27

Clean-up is extremely important and should be continuous throughout the grooving operation. All grooved areas of the runway shall be flushed with clear water as soon as possible to remove any slurry material not collected by the vacuum pickup. Flushing shall be continued until all pavement surfaces are clean to the satisfaction of the Resident Engineer.

The Contractor shall dispose of the slurry off of airport property. Waste material must not be allowed to enter the airport storm or sanitary sewer, or any natural or constructed waterways.

METHOD OF MEASUREMENT

4.1

When the project is constructed essentially to the lines, grades, or dimensions shown on the Plans and the Contractor and the Resident Engineer have agreed in writing by the use of form AER-981 that the plan quantities are accurate, no further measurement will be required and payment will be made for the quantities shown in the contract for the various items involved except that if errors are discovered after work has been started, appropriate adjustments will be made.

When the Plans have been altered or when disagreement exists between the Contractor and the Engineer as to the accuracy of the plan quantities, either party shall, before any work is started which would affect the measurement, have the right to request in writing and thereby cause the quantities involved to be measured as herein specified.

The quantity of Grooving to be paid for shall be the number of square yards of grooving, as specified, completed and accepted.

BASIS OF PAYMENT

5.1

Payment will be made at the contract unit price per square yard for runway grooving, which shall be full compensation for all materials, including water, labor, equipment, tools, runway cleaning, slurry removal and incidentals necessary to complete the work.

Payment will be made under:

Item AR501540 -- PCC Pavement Grooving -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR501550 PCC PAVEMENT MILLING

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of variable depth milling of the existing P.C.C. surface for profile correction or bituminous transitions.

CONSTRUCTION METHODS

2.1 EQUIPMENT

The machine used for pavement milling shall be a self-propelled diamond grinding machine capable of grinding the existing surface. The machine shall be capable of removing, in one pass, a layer of material at least 3 feet in width and 1/4 inch in depth. The machine shall be capable of accurately and automatically establishing profile grades by referencing from either the existing pavement or from an independent grade control to provide a ground surface within a tolerance of 1/4 inch in 16 feet when checked with a 16-foot straight-edge. It shall have an effective means of removing the excess material from the surface without permitting dust from the operation escaping into the area.

2.2 DISPOSAL

The material removed shall be disposed of at a location off the airport property.

METHOD OF MEASUREMENT

- 3.1 The quantity of pavement milling to be paid for shall be the number of square yards of pavement milling as measured in place, completed and accepted. Pavement milling will be paid for only once regardless of the number of passes needed to achieve a satisfactory texture or elevation. Pavement milling outside the limits designated by the Resident Engineer will not be measured for payment.

BASIS OF PAYMENT

- 4.1 Payment will be made at the contract unit price per square yard for PCC Pavement Milling. This price shall be full compensation for furnishing all materials and for all preparation, pavement milling and disposal; and all

CHECK SHEET #28

labor, tools, equipment and incidentals necessary to complete this item of work.

Payment will be made under:

Item AR501550 -- PCC Pavement Milling -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR501900 REMOVE PCC PAVEMENT

Effective: January 1, 2003

DESCRIPTION

1.1 This item of work shall consist of removing existing PCC pavement structure as described herein.

The Contractor shall remove PCC pavement of the thickness shown in the plans.

Typical construction details are shown in the plans. Exact locations of PCC pavement removal shall be determined by the Resident Engineer.

CONSTRUCTION METHODS

3.1 The Contractor shall sawcut the existing pavement structure full depth as shown in the plans at locations determined by the Resident Engineer. Sawcutting shall provide a vertical surface.

After completion of sawcutting, the Contractor shall remove the pavement structure using methods which will allow a vertical surface along all sides of the removal area.

Material obtained from removal operations shall be hauled to a disposal site off of airport property by the Contractor. No additional compensation will be made for hauling and disposal of the removed material. Existing aggregate base shall be compacted in accordance with Item 209. Existing subgrade shall be compacted in accordance with Item 152.

METHOD OF MEASUREMENT

4.1 The yardage to be paid for shall be the number of square yards of PCC pavement removal as measured in the field, completed and accepted.

BASIS OF PAYMENT

5.1 The accepted quantities of PCC pavement removal will be paid for at the contract unit price per square yard which price and payment shall be full compensation for furnishing all materials, equipment, labor, hauling, disposal and all other incidental items necessary to complete the work to the satisfaction of the Engineer.

CHECK SHEET #29

Payment will be made under:

Item AR501900 -- Remove PCC Pavement -- per square yard.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR
ITEM AR510000 TIE-DOWN/GROUND ROD

Effective: January 1, 2003

DESCRIPTION

- 1.1 This item shall consist of installing and removing tie downs and ground rods as shown on the plans or as directed by the Resident Engineer.

MATERIALS

- 2.1 The materials to be used for the tie downs and ground rods as shown on the plans or as directed by the Engineer. Concrete for the construction of the tie downs shall conform to the applicable sections of Item 610.

METHOD OF MEASUREMENT

- 4.1 The quantity of tie downs and ground rods shall be measured by the number of tie downs and ground rods, as shown on the plans or as directed by the Engineer.

BASIS OF PAYMENT

- 5.1 Payment shall constitute full compensation, including all labor, tools, equipment and incidentals necessary to complete this item of work.

Payment will be made under:

- Item AR510510 -- Tie Down -- per each.
- Item AR510515 -- Ground Rod -- per each.
- Item AR510900 -- Remove Tiedown -- per each.

State of Illinois
 Department of Transportation
 Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR605000 SILICONE JOINT SEALING FILLER

Effective: January 1, 2003

This Special Provision Modifies Item 605 Joint Sealing Filler of the Standard Specifications.

Replace 605-1.1 with the following:

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing filler capable of effectively sealing joints in Portland cement concrete pavements and structures.

Replace 605-2.1 with the following:

605-2.1 Joint Sealing Materials. The silicone joint sealing material shall conform to one of the following products:

Delete options (a), (b), (c), (d), and (e) in 605-2.1 and add the following:

(f) Dow Corning 888 non-sag silicone joint sealer shall conform to the following requirements:

Test Method	Test	Material Requirements
<u>As Supplied:</u>		
MIL-S-8802	Extrusion Rate, grams per minute	90 min.
ASTM D 1475	Specific Gravity	1.4 to 1.6
ASTM D 2202	Flow, mm (in.)	5 (0.2) max.
ASTM C 679	Tack-Free Time, minutes	90 max.
<u>Upon Complete Cure:</u>		
ASTM D 2240	Durometer Hardness, Shore A	10-25
ASTM D 412, Die C	Tensile stress at 150% strain, kPa (psi)	310 (45) max.
ASTM D 412, Die C	Elongation, percent	1200 min.
ASTM D 5329 ¹	Adhesion to concrete ² , % elongation	500 min.

Performance:

ASTM C 719	Movement 10 cycles at +100%/-50%	No Failure
ASTM C 793	Accelerated Weathering at 5000 hours	No cracks, blisters or bond loss

¹13 mm (0.5 inch) x 13 mm (0.5 inch) x 51 mm (2.0 inch) joint design.

²Sample cured 7 days at $25.0 \pm 1.0^{\circ}\text{C}$ ($77.0 \pm 2^{\circ}\text{F}$) and $50 \pm 5\%$ relative humidity.

(g) Crafcro Roadsaver 34902 non-sag silicone joint sealer shall conform to the following requirements:

Test Method	Test	Material Requirements
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As Supplied:

MIL-S-8802	Extrusion Rate, grams per minute	75 min.
ASTM D 792-A	Specific Gravity	1.1 to 1.6
ASTM C 679	Tack-Free Time, minutes	90 max.

Upon Complete Cure:

ASTM D 412, Die C	Tensile stress at 150% strain, kPa (psi)	310(45)max.
ASTM D 412, Die C (mod.)	Elongation ¹ , percent, min.	800
ASTM D 5329	Adhesion to Concrete ¹ min., % elongation	400
ASTM D 2240	Durometer Hardness, Shore A	20 max.

Performance:

ASTM C 719	Movement 10 cycles at +50%/-50%	No Failure
ASTM C 793	Accelerated Weathering at 5000 hours	No cracks, blisters or bond loss

¹Sample cured 28 days at $25 \pm 2.0^{\circ}\text{C}$ ($77.0 \pm 3^{\circ}\text{F}$) and $50 \pm 5\%$ relative humidity.

Add 605-2.2

605-2.2 Requirements For Silicone Joint Sealer. A written certification from the manufacturer stating that the supplied silicone joint sealer complies with the appropriate specifications listed above, shall be submitted to the resident engineer prior to installation. The date of manufacture shall be provided with each lot. Material more than six months old will not be accepted.

Add 605-2.3

605-2.3 Backer Rod. The backer rod shall conform to ASTM D 5249, Type 3, and to the dimensions shown on the plans.

Replace 605-3.1 with the following:

CHECK SHEET #31

605-3.1 Time Of Application. The joints shall be sealed immediately following the curing period or as soon thereafter as weather conditions permit, and before the pavement is open to traffic (including construction traffic).

Replace 605-3.2 with the following:

605-3.2 Equipment. All equipment necessary for the proper construction of this work shall be on the project and in first-class working condition. The equipment shall be as recommended by the manufacturer of the sealer and approved by the Engineer before construction is permitted to start. It shall also meet the following requirements:

Sawing Equipment. Sawing equipment shall be capable of sawing Portland cement concrete to the specified width and depth.

Air Compressor. Compressed air equipment shall have traps to prevent the inclusion of water and/or oil in the airline.

High Pressure Water Washer. The high pressure water washer shall be capable of spraying water with a pressure of 3,000 psi (20,500 kPa).

Joint Sealing Equipment. The joint sealing equipment shall consist of a power-driven apparatus capable of extruding the material as a continuous feed. The extruding nozzle tip of the machine shall be of such design as to fill the joint uniformly.

Replace 605-3.3 with the following:

605-3.3 Joint Sawing And Preparation. The joints shall be sawed and prepared according to the following procedure:

(a) Joint Sawing and Cleaning The minimum allowable joint width is 1/2". The width to depth ratio for the silicone joint sealer shall be 2:1. (Example: A 1/2" wide joint will have a silicone joint sealer thickness of 1/4") The joint sealer shall be recessed 3/8" below the surface of the pavement. The depth of the second stage saw cut shall be enough to allow for the joint sealer recess, the joint sealer thickness and the height of the compressed backer rod. (A compressed backer rod may be slightly taller than its uncompressed diameter.)

(1) New Portland Cement Concrete Pavement. The joint shall be sawed to the dimensions shown on the plans in two stages. The first stage shall consist of sawing joints to prevent random cracking according to Item 501 of the *Standard Specifications for Construction of Airports*.

The second stage saw cut shall then be performed no earlier than 72 hours after the concrete has been placed. Immediately after performing the second stage saw cut, both faces of the joint shall be cleaned of all laitance and contaminants using a high pressure water wash with a minimum pressure of 3000 psi (20,500 kPa). The joint shall be allowed to dry for at least 7 total days of dry weather since the placement of the concrete.

(2) Existing Portland Cement Concrete Pavement. The joint shall be sawed to the dimensions shown on the plans. Immediately after performing the saw cut, both faces of the joint shall be cleaned of all laitance and contaminants using a high pressure water wash with a minimum pressure of 3,000 psi (20,500 kPa). The joint shall be allowed to dry overnight before sand blasting.

(b) Joint Preparation. Joint preparation and sealant installation shall be accomplished within the same day. These operations will only be allowed to proceed when the joint is dry and the air temperature is above 41°F (5°C).

Both faces of the joint shall be sandblasted using a separate pass for each face. The nozzle shall be held at an angle of 30-90 degrees to the joint face at a distance of 1-2 inches (25-50 mm). Sandblasting shall be considered acceptable when the entire joint width of both joint faces has a rough texture to a joint face depth of at least 1.75 times the joint width. There shall be no evidence of saw marks on the joint faces. After sandblasting, the joint shall be cleaned of debris using clean compressed air at a minimum pressure of 90 psi (620 kPa). Gas or electric powered blowers are not acceptable. After the joint has been cleaned with compressed air, the backer rod shall be installed to a uniform depth as shown on the plans.

The contractor shall not install any joint sealer material until the Resident Engineer has inspected and approved the condition of the joints immediately prior to the installation of the sealer.

Delete 605-3.4 and replace with the following:

605-3.4 Placing Joint Sealer. Joint preparation and sealant installation shall be accomplished within the same day. These operations will only be allowed to proceed when the joint is dry and the air temperature is above 41°F (5°C). The sealant shall be applied using equipment recommended by the manufacturer at the thickness shown on the plans. If a non-sag sealer is used, the surface of the sealant shall then be tooled such that full contact is obtained between the sealant and the joint face and the required recess is obtained. If the joint becomes wet and/or dirty during sealing, sealing will not be permitted to resume until the joint has been restored to a clean and dry state.

METHOD OF MEASUREMENT

605-4.1 DELETE: Entire Paragraph.

ADD: The joint sawing and sealing for the proposed PCC pavement shall be incidental to Item 501. No separate measurement for payment will be made for this item.

BASIS OF PAYMENT

605-5.1 DELETE: Entire Paragraph.

ADD: Payment for joint sealing in the new PCC Pavement shall be incidental to Item 501.